INTERGENERIC AND INTRAGENERIC PHYLOGENETIC RELATIONSHIPS OF *ENCYCLIA* (ORCHIDACEAE) BASED UPON HOLOMORPHOLOGY

By

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This work is dedicated to all the orchidologists that have struggled throughout the centuries to understand the relationships of Orchidaceae.

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TABLE OF CONTENTS

Abstract of Dissertation Presented to the Graduate School
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The goal of taxonomy is to provide a classification system that is natural and predictive. This project examines the classification of the genus *Encyclia* (Orchidaceae) *sensu* Dressler. The objectives of this research are to determine the position of *Encyclia* within the subtribe Laeliinae, and to resolve the phylogeny of *Encyclia* to the sectional level. A holomorphological approach, which combines characters from several disciplines, was used to develop a total-evidence hypothesis of the phylogenetic relationships. Characters from floral and vegetative morphology, secondary glucoside chemistry, and DNA sequences from the plastid and nuclear genomes were utilized. The molecular data is derived from sequencing the region of the Internal Transcribed Spacers (ITS) and the 5.8S ribosomal gene from the nuclear genome, and two regions from the plastid genome, the *trnL-F* region (transfer RNA of leucine) and the *matK* gene (a RNA maturase). The data matrix was analyzed using a parsimony algorithm. Homoplasious characters were down-weighted by successive reweighting based on their

individual rescaled consistency indexes. The final weighted holomorphology analysis produced one tree of 3242 steps. This analysis shows that *Encyclia* is not monophyletic as circumscribed by Dressler. The results imply that classification schemes based solely on floral morphology may be misleading. The taxonomic consequences of this research are that five of the six sections of *Encyclia* have been raised to generic status. Two have new generic names, *Euchile* and *Ostlundia*, and three have reverted to older names, *Prosthechea*, *Dinema*, and *Encyclia*. One sectional name, *Hormidium*, has been abandoned.

CHAPTER 1
INTRODUCTION

Background

Floral diversity of the orchid family has intrigued botanists for centuries (Marden, 1971). The floral form within the family is extremely plastic and produces a variety of eye-captivating shapes that mimic bees, wasps, butterflies, or moths (Simon, 1975). The flowers invoke images that can resemble doves, swans, frogs, lizards or miniature men (Arditti, 1992; Senghas, 1993). Orchidaceae are the largest flowering plant family with 800-900 genera and 25,000-35,000 species (Sheehan and Sheehan, 1994). The family is divided into 5 subfamilies, 20 tribes, and 74 subtribes (Dressler, 1993). The members of subtribe Laeliinae are among the most commonly cultivated and frequently hybridized orchids (Withner, 1988). *Encyclia* is included in the subtribe Laeliinae, which consists of 43 genera (Dressler, 1993). The taxonomy of this subtribe appears artificial due to its reliance on pollinia number (Dressler, 1993). For example, the presence of eight pollinia has been used to group plants from Mexico and Brazil which have very different vegetative morphology, into the same genus, *Laelia*.

Encyclia is a diverse genus encompassing about 200 mostly epiphytic species. The range of *Encyclia* extends from Mexico to the West Indies, including Florida, and southward throughout most of Central America and tropical South America. There are two apparent centers of speciation, one in southern Mexico and the other in southern Brazil. The genus is characterized by: (1) pseudobulbs with 1-4 leaves, (2) labellum free

or partially adnate to the column, and (3) the terminal anther containing four waxy pollinia with caudicles (Hooker, 1828; Lindley, 1831; Luer, 1972). The shape of the column is the most consistent feature by which specimens may be placed to subgenus level (Dressler and Pollard, 1976). The classification of *Encyclia* by Dressler and Pollard will be used as the starting point for this investigation (Table 1-1). Note that the species in section *Osmophytum* have recently been transferred to *Prosthechea* (Higgins, 1997) and the species in section *Euchile* have been transferred to *Euchile* (Withner, 1998).

Table 1-1. Classification of *Encyclia*.

Subgenus	**Sections**
Dinema	(monotypic)
Encyclia	*Encyclia* *Leptophyllum*
Osmophytum	*Osmophytum* *Hormidium* *Euchile*

(Dressler and Pollard, 1971)

Problem Statement

The objectives of this research were to determine the position of *Encyclia* within the subtribe Laeliinae, and to resolve the phylogeny of *Encyclia* at the sectional level. The classification of *Encyclia* has been problematic since it was described by Hooker in 1828. This genus provides good examples of unique pollination biology and convergent floral morphology in two centers of speciation in disjunct xerophytic tropical forests. This convergent morphology may have resulted in a misleading classification. Previously, the mode of lip encircling the column has been used to suggest relationships within the subtribe (Hooker, 1828). The use of this single morphological floral character is unreliable because this is probably a homoplasious character in the subtribe. A

holomorphological approach, that combines characters from several disciplines, will be used to develop a total-evidence hypothesis of phylogenetic relationships.

Approach

Holomorphology, i.e., the totality of characters (Hennig, 1966), was the basis of this study of *Encyclia*. This study utilized characters from DNA sequences, a secondary chemical character (glucoside crystals), and floral and vegetative morphology. The molecular study included sequences from the ribosomal region of Internal Transcribes Spacer (ITS) from the nuclear genome and two genes from the plastid genome, *trnL-F* (transfer RNA for leucine) and the *matK* gene (a RNA maturase). Morphological and molecular data was analyzed separately and then combined for a total-evidence analysis. Sixty-one species were included in the analysis (represented by 66 specimens). The voucher numbers are listed in Appendix A.

Ingroup Selection

The ingroup taxa (30 species) were selected to represent all sections of *Encyclia* (Table 1-2). The type species for each section were sequenced when possible; however, the type for the genus (*Encyclia* section *Encyclia*), *E. viridiflora*, has never been recollected and has been lost to science. Specimens have been chosen to include as much geographic variation as possible from Florida, Mexico, Brazil and the Caribbean. Variation in floral morphology and biology has also been accounted for by including resupinate and non-resupinate flowers, as well as wasp and bee pollinated species. Species resolution was tested by inclusion of two species that have been

placed in synonymy, *Encyclia chimborazoensis* (Schltr.) Dressler and *E. fragrans* (Sw.) Lemée, and by using two specimens for several species (*E. tampensis, E. mariae, E. polybulbon, E. luteorosea*, and *E. subulatifolia*).

Table 1-2. Ingroup Taxa.

Subgenus	Taxon	Origin
Encyclia	Section *Encyclia*	
	Encyclia adenocaula (Llave and Lex.)Schltr.	Mexico
	Encyclia aromatica (Bateman) Schltr.	Mexico
	Encyclia asperula Dressler & Pollard	Mexico
	Encyclia bractescens (Lindl.) Hoehne	Mexico
	Encyclia candollei (Lindl.) Schltr.	Mexico
	Encyclia cordigera (H. B. K.) Dressler	Mexico
	Encyclia dichroma (Lindl.) Schltr. in Schlechter	Brazil
	Encyclia diurna Schltr. in Fedde	Ecuador
	Encyclia kienastii (Rchb.f.) Dressler & Pollard	Mexico
	Encyclia randii (Barb. Rodr.) Porto & Brade	Brazil
	Encyclia tampensis (Lindl.) Small	Florida
	Section *Leptophyllum* Dressler & Pollard	
	Encyclia cyanocolumna (Ames, F.T. Hubb. & C. Schweinf.) Dressler	Mexico
	Encyclia luteorosea (Rich. and Gal.) Dressler & Pollard	Mexico
	Encyclia subulatifolia (A.Rich & Galeotti) Dressler	Mexico
	Encyclia tenuissima (Ames, Hubb. and Schweinf.) Dressler	Mexico
Osmophytum	Section *Osmophytum* (Lindl.) Dressler & Pollard	
	Encyclia aemula (Lindl.) Carnevali & I. Ramírez	Ecuador
	Encyclia chimborazoensis (Schltr.) Dressler	Peru
	Encyclia cochleata (L.) Lemée	Mexico
	Encyclia cretacea Dressler & Pollard	Mexico
	Encyclia fragrans (Sw.) Lemée	Mexico
	Encyclia glauca (Knowles and Westc.) Dressler & Pollard	Mexico
	Encyclia ionocentra Dressler	Costa Rica
	Encyclia ochracea (Lindl.) Dressler	Mexico
	Encyclia prismatocarpa (Rchb. f) Dressler	Costa Rica
	Encyclia vitellina (Lindl.) Dressler	Mexico
	Section *Hormidium* (Lindl.) Dressler & Pollard	
	Encyclia pseudopygmaea (Finet) Dressler and Pollard	Mexico
	Encyclia pygmaea (Hook.) Dressler	Mexico
	Section *Euchile* Dressler & Pollard	
	Encyclia citrina (Llave and Lex.) Dressler	Mexico
	Encyclia mariae (Ames) Hoehne	Mexico
Dinema	(Lindl.) Dressler & Pollard	
	Encyclia polybulbon (Sw.) Dressler	Mexico

Outgroup Selection

A comprehensive outgroup was required because *Encyclia sensu lato* may not be monophyletic (Maddison, et al., 1984). The outgroup taxa (31 species) were selected from the subtribe Laeliinae and sister subtribes within Epidendreae based on the affinities proposed by Dressler (1993). Three taxa not in Laeliinae were used as an outgroup for the subtribe. *Meiracyllium trinasutum* (subtribe Meiracylliinae) was chosen as an outgroup because of a velamen type that suggests a close alliance to the Laeliinae. *Pleurothallis racemiflora* and *Restrepiella ophiocephala* (subtribe Pleurothallidinae) were selected because the presence of the *Pleurothallis* seed type in *Ponera,* a member of Laeliinae (Dressler, 1993). Outgroup taxa (Table 1-3) were chosen from the *Cattleya* alliance, within the subtribe Laeliinae in order to represent as much variation as possible, and from the subfamily Epidendroideae to help delimit the subtribe.

Table 1-3. Outgroup Taxa.

Taxon	Subtribe
Acrorchis roseola Dressler	Laeliinae
Brassavola cucullata (L.) R. Br.	Laeliinae
Broughtonia negrilensis Fowlie	Laeliinae
Cattleya dowiana Bateman	Laeliinae
Cattleya forbesii Lindl.	Laeliinae
Cattleyopsis lindenii Cogn.	Laeliinae
Domingoa kienastii (Rchb.f.) Dressler	Laeliinae
Epidendrum ibaguense Pavon ex Lindl.	Laeliinae
Epidendrum conopseum R. Br. in Ait.	Laeliinae
Hagsatera brachycolumna (L.O. Williams) R.González	Laeliinae
Hexadesmia Brongn.	Laeliinae
Hexisea imbricata (Lindl.) Rchb.f.	Laeliinae
Homalopetalum pumilio (Rchb.f.) Schltr.	Laeliinae
Isochilus major Cham. & Schltdl.	Laeliinae
Jacquiniella teretifolia (Sw.) Britton & P. Wilson	Laeliinae
Laelia purpurata Lindl. & Paxton	Laeliinae
Laelia rubescens Lindl.	Laeliinae
Meiracyllium trinasutum Rchb.f.	Meiracylliinae
Myrmecophila tibicinis (Bateman) Rolfe	Laeliinae
Nidema boothii (Lindl.) Schltr.	Laeliinae
Pleurothallis racemiflora Lindl. ex Lodd.	Pleurothallidinae
Ponera striata Lindl.	Laeliinae
Psychilis mcconnelliae Sauleda	Laeliinae
Psychilis krugii (Bello) Sauleda	Laeliinae
Reichenbachanthus cuniculatus (Schltr.) Pabst.	Laeliinae
Restrepiella ophiocephala (Lindl.) Garay and Dunsterv.	Pleurothallidinae
Rhyncholaelia glauca (Lindl.) Schltr.	Laeliinae
Scaphyglottis pulchella (Schltr.) L.O. Williams	Laeliinae
Schomburgkia splendida Schltr.	Laeliinae
Sophronitis cemua Lindl.	Laeliinae
Tetramicra elegans (Hamilt.)Cogn.	Laeliinae

CHAPTER 2
MORPHOLOGY

Introduction

Morphology has been the basis of plant classification since its inception. Traditionally, plants have been grouped based on a subjective analysis of their overall similarities. This phenetic approach does not distinguish between ancestral and derived plant characteristics. The current cladistic paradigm i.e., a cladistic or phylogenetic approach, groups plants based on their shared derived characters (synapomorphies) (Wiley, et al., 1991). Phenetic studies have been useful for detecting terminal units in difficult species complexes (Johnson and Linder, 1995). Morphological and anatomical data have an important role in resolving relationships in Orchidaceae (Adams, 1959), with floral morphology providing the primary source of characters in many taxonomic studies of orchids. However, evidence from cpDNA analysis suggests a previously unsuspected degree of plasticity in floral morphology, demonstrated by the convergence of gross floral features (Chase and Palmer, 1997). Rapid changes or reversals in floral morphology may have resulted in poor resolution of phylogenetic relationships in traditional classifications. Chase and Palmer (Chase and Palmer, 1989) hypothesized that gross floral morphology is deceptive and cannot be trusted to lead to accurate phylogenetic relationships in Orchidaceae. *Oncidium* is an example of a paraphyletic genus that resulted from an over reliance on gross floral morphology in its circumscription. Molecular approaches do not supplant studies of other features (Hillis,

1987). Studies of vegetative and floral characteristics are needed to augment molecular data since most orchid subtribes are relatively uniform in non-floral aspects (Chase, et al., 1994; Pridgeon, et al., 1999). A new understanding of phylogenetic relationships in orchids will emerge only through the syntheses of data from various scientific disciplines (Chase, et al., 1994). However, any morphological study of Orchidaceae must fully consider the homoplasious nature of these characters.

Materials and Methods

Plants were grown in the Plant Science Facility at the University of Florida. These were collected during field expeditions to Mexico and Dominican Republic, donated by individuals or institutions, or purchased from commercial vendors. The plants were photographed and specimens collected at various stages of their reproductive cycle. Representative vegetative and floral material was pressed and dried in a "Blue M" electric oven (Model #0V-510A-2) at 53° C for use as herbarium vouchers. Flowers and capsules were observed under a microscope and photographed using a Zeiss Tesovar. Flowers were dissected, attached to a Kodak projector slide cover glass using transparent double stick tape and scanned with a Sharp JX-330 scanner at 600 dpi. This procedure is a modification of a technique developed at the National Museum of Brazil (Válka Alves, 1996). Capsules were allowed to dehisce on the plant to observe the method of opening. Entire flowers and capsules were also preserved in 95% ethanol.

Morphological Characters

The morphological features were selected to include the characteristics that taxonomists have traditionally used to either group or segregate the species and genera of Laeliinae. Specific characters were selected to distinguish Encyclia's subgenera and sections. Characteristics that are useful in identifying species tend to be homoplasious across the subtribe (Arditti, 1992). Additional characters were then selected based on the definition of subtribes of Dressler (1993). Laeliinae have a specific velamen type, seed testa, and lack a column foot. These characters were obtained through direct observation of living or preserved specimens. Certain characters were obtained from published descriptions when living or preserved plants were not available (Withner, 1988; 1990; 1993; 1996; 1998).

Characters included in the analysis included several from vegetative morphology, reproductive structures, and one secondary plant chemistry. Discrete character states (present/absent) were used wherever possible. Size characters were defined in relative terms (ratios/comparisons) where possible. Other measurements were delimited by gaps in the data (Appendix B). Certain character states were delimited based on values traditionally used by orchid taxonomists. A summary of characters and their states is found in Table 2-1.

Vegetative Morphology

Vegetative morphology refers to all parts of the plant except the reproductive structures. These characteristics are intrinsic to the plants existence and not dependent on reproductive cycles. The parts examined were the growth habit, pseudobulbs, leaves, and roots.

Whole plant

There are two general growth forms found in Orchidaceae, monopodial and sympodial. However, only the sympodial form is found in Laeliinae. The plant habit has been shown to be taxonomically useful (Pridgeon, et al., 1999). It describes whether a plant is stationary or "mobile" (Figure 2-1). A plant that tends to grow in a stationary tuft was coded as “caespitose.” Whereas, a plant that "moves" by growing across a surface was coded as “creeping.” The plant size is based on the arbitrary value of 25 cm because this is the value traditional used by orchidologists to delimit plant height (McLeish, et al., 1995). Plants whose height is 25 cm or greater were coded as “large”, while plants less than 25 cm were coded as “small” (Appendix B). The stem shape is a description of a single sympodial growth as a unit. A pencil-like stem was coded as “stem” while a cane-like stem was coded as “cane” (Figure 2-2).

Orchid pseudobulbs

Epiphytic orchids often have enlarged portions of the stem called pseudobulbs, which are used for water and carbohydrate storage. These organs were coded as being present or absent. The shape and composition of the pseudobulbs also were coded as discrete characters. Pseudobulbs may be circular in cross section or flattened (Figure 2-3). The pseudobulb may arise directly from the rhizome or have a stipe (stalk) between it and the rhizome (American Orchid Society, 1974). Pseudobulbs with a stipe were coded as "stipitate" (Figure 2-4). The pseudobulb may form in one internode or it can consist of several internodes (Dressler, 1993). This character has been used to distinguish genera (Pridgeon, et al., 1999). A single-noded pseudobulb was coded "heteroblastic" while a pseudobulb with multiple nodes was coded "homoblastic" (Figure 2-5). Typically, pseudobulbs have a solid interior, but they may have a hollow cavity

(Figure 2-6). These cavities are often associated with colonies of ants. The surface texture of the pseudobulb was coded as "smooth," "sandy," "wrinkled," or "ridged/grooved" (Figure 2-7). Pseudobulbils are a small secondary swelling above the lowest leaf atop a pseudobulb (Figure 2-8). This previously undescribed feature is analogous to bulbils (Harris and Harris, 1994). Pseudobulbs were coded as "large" if they exceeded 7 cm in length and as "small" if 7 cm or less (Appendix B). The pseudobulb shape was based on a vertical section and coded as follows (Arditti, 1992): "ovoid" if the slice is oval; "conic-ovoid" if the slice is an inverted cone on an oval; "ellipsoid" if the slice is a ellipse; "cylindrical" if the slice is rectangular; or "spindle-shaped" if the slice is rectangular and swollen on one end (Figure 2-9).

Orchid leaves

Orchid leaves have parallel venation like most other monocotyledonous plants. The shapes of orchid leaves vary from typical elliptic, ovate, lanceolate or oblanceolate leaves to terete or grass-like. The leaves of a plant are the primary photosynthetic organs that are sometimes modified for water storage. Leaf vernation is systematically useful (Pridgeon, et al., 1999). Leaf types were coded as "fleshy" for soft thick water storage leaves, "intermediate" for typical coriaceous orchid leaves, and "grass-like" for very thin narrow leaves. The leaf position can be either distichous along the stem or terminal near the top of the pseudobulb (Figure 2-10). Leaf shapes were coded as: "linear" for a long narrow leaf, "linear-elliptic" for a long leaf slightly swollen in the middle, "oblong-elliptic" for a wider leaf that is slightly swollen, or "terete" for a leaf that is pencil-like with a groove (Figure 2-11). The leaf width was coded as narrow if 2.5 cm or less, or broad if greater than 2.5 cm. Leaves in Laeliinae are duplicate and usually emerge folded (Dressler, 1993). The leaf surface posture was coded as "conduplicate" for

duplicate leaves that do not open entirely; "flat" for duplicate leaves that open so the margins and midrib are in the same plane; or "terete" for circular leaves with only a groove (Figure 2-12). The leaf posture was coded as "rigid" for leaves that do not bend or "flexible" for leaves that bend under their own weight (Figure 2-13). The leaf margin was coded "entire" for a smooth undisrupted edge or "erose-dentate" for a disrupted (rough) margin (Figure 2-14). The typical number of leaves when a plant reached reproductive maturity was coded as 1, 2, 3, or 4+. The leaf length is a relative measurement made by comparing the leaf to the stem (pseudobulb) length and was coded as being shorter or longer.

Orchid roots

Orchid roots function as a hold-fast (anchorage) for the plant, photosynthesis, water and nutrient uptake and storage. These adventitious roots typically arise from the rhizome. Root types were determined by cutting the root with a razor blade: thick soft roots were coded as "fleshy," thin hard roots were coded as "sinewy," and roots with a hard core surrounded by a fleshy covering were coded as "intermediate." Orchid roots have a spongy layer of cells outside the exodermis known as the velamen that functions for water storage (Figure 2-15). The velamen layers were counted under a light microscope after hand sectioning of a living root or obtained from the literature (Pridgeon, 1987; Arditti, 1992).

The Pleurothallis type velamen is characterized by one to three layers of cells that are extended in radial direction (Porembski and Barthlott, 1988). Epidermal cells were characteristically smaller if the velamen was multi-layered. The exodermal cells are slightly thickened in the outer walls (Arditti, 1992).

The Epidendrum type velamen is characterized by 4-12 layers with endovelamen cells that are extended in radial direction and thickenings that form composed ledges (Porembski and Barthlott, 1988). Endovelamen cells are typically larger than the epivelamen cells (Arditti, 1992).

Reproductive Morphology

Reproductive characters are harder to collect since the structures are transitory. Nonetheless, reproductive characters are important in plant classification. However, floral morphology in orchids is extremely plastic in evolutionary terms (Pridgeon, et al., 1999). The structures examined were the inflorescence, the flower, the capsule dehiscence, and the seed coat.

Plant inflorescence

The inflorescence is collectively the flowers and the flower-bearing branch (or system of branches). If the inflorescence arises from a sheath, it was coded as having a "spathe" (Figure 2-16). Otherwise, the spathe was coded as absent. The form of the inflorescence was coded as "simple" when the flowers were arranged along the peduncle, "fasciculate" when the flowers are clustered near the end, or "scorpioid" if coiled (Figure 2-17). The type of inflorescence was coded as "sessile" if the peduncle is very short or absent, as a "raceme" if the peduncle was unbranched, or as a "panicle" if the peduncle was branched forming a rachis (Figure 2-18). The position of the inflorescence was coded as "lateral" or "terminal." The inflorescence length was coded as being "shorter" or "longer" based on the relative length in relation to the leaf length.

Certain species can flower on a previous year's inflorescence. This ability to re-flower on old inflorescences was coded as "yes" or "no."

Orchid flowers

The reproductive structures of an angiosperm are collectively called a flower, including the calyx, corolla, gynostemium, pollinarium, and ovary, which develop into a fruit. Orchid flowers have several distinctive characteristics: bilateral symmetry (zygomorphy), a labellum, a central column containing a rostellum and pollinia, and an inferior ovary; the fruit is a capsule with minute seeds. Orchid flowers have an inferior ovary located in the receptacle that does not develop unless the flower is pollinated. The perianth consists of two alternating whorls, the sepals (calyx) and the petals (corolla). The "male" and "female" structures (style, stigma, and filament) are fused into a central column (gynostemium). The entire stem of the flower including both the inferior ovary and the pedicel is typically called the "pedicel" by orchidologists since the ovary development is delayed until pollination. If there is an articulation (abscission zone) between the ovary and the true pedicel that allows the flowers to fall off leaving a persistent pedicle on the rachis, then the ovary was coded as "jointed." The number of flowers was coded as "few" for 1-3 flowers and "many" for 4 or more flowers (Appendix B). The orientation of the flower was coded as "resupinate" if the flower twists 180° during opening, orienting the lip on the bottom, or as "non-resupinate" if the bud does not rotate, leaving the lip uppermost (see Figure 2-19)(Ernst and Arditti, 1994). Flower size was coded as "small" for flowers with a natural spread of 2.5 cm or smaller and "large" for flowers larger than 2.5 cm (Appendix B). If the veins in the flower have a different color than the surrounding tissue, producing striations, the character of colored veins was coded as "present" (Figure 2-20). The presence or absence of a floral nectary was

coded as such (Figure 2-21). Typically, the pseudobulb matures before an inflorescence is produced in Laeliinae. However, some species produce the inflorescence before the pseudobulb matures. The growth stage of the pseudobulb when flowers are produced was coded as "mature" if the pseudobulb was fully formed before flowering or as "immature" if the flowers are produced while the pseudobulb is forming (Figure 2-22).

Sepals and petals. The sepals and petals make up the perianth of the flower. In orchids, the outer whorl consists of three sepals, while the inner whorl consists of two petals and a third modified petal called the lip or labellum. The lateral sepals were binary coded as being "free" or "fused." The amount of fusion was then coded as being "none," "connate at base" or "connate" (Figure 2-23). The length of the sepals was coded as a relative measurement in comparison to the petals and was coded as "longer" or approximately "equal" (Figure 2-24). The sepal width is also a relative measurement in comparison to the petals and was coded as being "narrower," "similar," or "wider" (Figure 2-25). The sepal and petal margins were coded as "undulate" or "not undulate" (Figure 2-26). The general appearance of the sepals and petals, i.e., color, markings, etc., was coded as "similar" or "different."

Labellum. One of the petals of an orchid flower is highly modified to form a lip. The lip is important adaptation to facilitate cross-pollination (Pridgeon, et al., 1999). When the lip was fused to the column it was coded as "adnate," if the lip is attached to the receptacle in same place as the column it was coded as "partially adnate," otherwise the lip was coded as "free." The degree of lip adnation was separated into "partially adnate," "basally adnate" if attached to base of column, adnate "less than ½" of column, or adnate "more than ½" of the column (Figure 2-27). The general configuration of the lip was coded as "tubular" if it encircles the column or "not tubular" (Figure 2-28). The attachment of the lip was coded as "hinged" if it was flexible allowing movement or "not

hinged" (Figure 2-29). The transition of the labellum from the base to the blade was coded as "gradual" for a smooth change in lip shape or "abrupt" for a rapid change (Figure 2-30). The number of lip lobes was coded as, 1, 2, or 3 (Figure 2-31). The size of the side lobes is a relative measurement in comparison to the mid-lobe and was coded as "smaller," "equal," or "larger." The adnation of the side lobes to the column was coded as "fused" or "free" (Figure 2-32). The side-lobe posture was coded as "upturned" when they are perpendicular to the mid-lobe, "flat" when they are in the same plane, "clasping" when they touch the column, "encircle" when they wrap around the column and touch each other above, or "down-turned" when they are perpendicular in a downward direction (Figure 2-33). The mid-lobe plane was coded as, "flat," "reflexed," "recurved,' "cupped," or "tubular" (Figure 2-34). Calli adorn the upper surface of the labellum near the anther cap. The callus shape was coded as "none" when it was absent, as "platform," "1 ridge," "2 ridges," "3 plus keels," "transverse ridges," or "papillate" when various structures occurred (Figure 2-35). The lip shape and callus can be diagnostic in orchid classification (Pridgeon, et al., 1999).

Column. The gynostemium or column is formed through a complete fusion of stigma, style, and filaments. The pollen masses, pollinia, are located in the anther cap, which is near the apex of the column. The stigmatic surface is a sticky depression on the lower side of the column. There is a wall of tissue between the stigma and the pollinia, known as the rostellum, that prevents self-pollination (Figure 2-36). The column foot is a ventral extension near the base of the column that was coded as "present" or "absent" (Figure 2-37). The general posture of the column was coded as "straight" or "curved" (Figure 2-38). Appendages on the lower side of the column are known as wings. These wings may be "present" or "absent" (Figure 2-39). The column has three teeth at the tip that surrounds the anther cap. If the top (mid) tooth has a ligulate

appendage, it was coded as "present" (Figure 2-40). The mid-tooth shape was coded as "deltoid" if it is triangular in shape, "obtuse" if rounded, "lanceolate" if pointed, "truncate" if square, or "fimbriate" if it has finger-like extensions (Figure 2-41). The mid-tooth size is a relative measurement to column size and was coded as "small" or "large" (Figure 2-42). The relative length of the mid-tooth to the lateral teeth was coded as "shorter," "equal," or "longer" (Figure 2-43). The lateral tooth shape was coded as "deltoid," "obtuse," "lanceolate," "truncate," "fimbriate," "wing-like," or "hooked" (Figure 2-44). The column teeth are separated by sinuses that were coded as "shallow" or "deep." The anther cap sits between the column teeth. If the mid-tooth presses down on the anther cap, it was coded as "appressed" (Figure 2-45). The length of the anther cap is a relative measurement in relation to the mid-tooth. This length was coded as "subequal" unless the anther cap protrudes beyond the mid-tooth, a condition that was coded as "protruding" (Figure 2-46). The anther position has considerable significance in orchid classification (Pridgeon, et al., 1999). Typically, the anther cap is in a terminal position in Laeliinae. However, it may rarely occur on top of the column in Epidendroideae (Figure 2-47).

The pollinia form inside the anther cap. Pollinium morphology for the Epidendreae was illustrated by Brieger (1975; 1976). However, developmental studies suggest that pollinia number may be a misinterpreted character state (Freudenstein and Rasmussen, 1999). The number of pollinia was coded as 2, 4, 6, 8, or 12. The shape of the pollinia is ovoid. If these are compressed in one plane they were coded as "flattened" (Figure 2-48). The relative size of the pollinia, to each other, was coded as "equal" or "unequal." The pollinia can be free or attached by a stem at the base. This stem is a caudicle if it is an extension of the pollinia, or a stipe if it is of stigmatic origin. The wall of tissue (rostellum) separating the pollinia from the stigmatic surface can have

a "thin" or "thickened" center. If the pollinia stem is attached to the rostellum in such a way that the rostellum tears when the pollinia are removed, then the pollinia is said to have a viscidium. The present or absence of the viscidium was coded likewise (Figure 2-49). The relative position of the rostellum in the column was coded as "vertical"(|), "horizontal"(—), or "inclined"(/) when the column is held in a horizontal position.

Seed capsule

The capsule of orchids can contain several million seeds (Arditti, 1992). The seed consist of a tiny embryo and a net-like testa. The embryo lacks a cotyledon and endosperm is also lacking. The general capsule shape is based on its cross section, and was coded as being "uniform" or "triangular." The triangular shaped capsules were grouped into "3-winged" or "unwinged" (Figure 2-50). Orchid capsules release seeds by opening a suture along the midline of each carpel during dehiscence (Pridgeon, et al., 1999). The mechanism of opening is either a suture that splits open or a suture that is covered by a strap of tissue, which lifts to uncover a suture (Figure 2-51). This previously unreported strap of tissue was coded as "present" or "absent." The ovary may be located in the receptacle directly behind the perianth or near the attachment of the receptacle to the pedicel. When the ovary is near the base of the receptacle the capsule apex has a beak, which was coded as "present" or "absent" (Figure 2-52). The surface texture of the capsule was coded as being "smooth", "warty", or "ribbed" (Figure 2-53).

The seed type is defined on the basis of size and surface characteristics of the testa (Molvray and Kores, 1995). The ornamentation of the seed coat is taxonomically significant (Pridgeon, et al., 1999). The seed of the Pleurothallis type are 150-300 μm long and 2-3 testa cells in length. The testa cells are all of the same length with flat

marginal ridges that are topped with a distinct cell border and with the anticlinal walls having prominent thickenings (Rauh, et al., 1975). The seed of the Elleanthus type are about 200 um long (Barthlott, 1976). The medial testa cells are strongly elongate while the basal and apical cells are slightly elongate. The cells of the testa are deeply trough-like with cell-border ridges. The periclinal walls have longitudinal reticulate thickenings. The seed of the Epidendrum type are elongate to 500-1000 um long (Barthlott, 1976). All testa cells are similar with cell corners that are acute-angled. The cell border is not visible and the anticlinal walls are narrow, high and sharp-angled (Figure 2-54). The seed type was coded as “Elleanthus” type, “Pleurothallis” type or the “Epidendrum” type (Dressler, 1993).

Secondary Plant Compounds

Secondary chemistry attributes important ecological concepts to floral biology. Flowers of *Encyclia* subgenus *Osmophytum* precipitate glycoside crystals when fixed in ethanol (Pabst, et al., 1981). This secondary chemistry character of glucoside crystals, flavonoid aglycone structure and linked carbohydrate sidechain of glucorhamnose, is easily observed by preserving flowers in ethanol with 5% sodium hydroxide (Ferreira, et al., 1986). These crystals fluoresce under ultraviolet light, probably adding to the visibility of flowers for insect pollinators in a dense forest. Flowers were preserved in 95% ethanol to precipitate glucoside crystals that can be observed in the glass specimen jar. The presence of crystals in the flower can also be detected by a sandy feel when cutting the column of a flower with a razor blade. These crystals were coded as “present” or “absent” (Figure 2-55).

Morphological Phylogenetic Analyses

The morphological matrix (Table 2-2) was constructed using MacClade 3.08 (Maddison and Maddison, 1992). A parsimony analysis was conducted using PAUP* 4.0 (Swofford, 1998). Due to the size of the matrix, a heuristic algorithm was preformed. This algorithm is not guaranteed to find the shortest tree. However, the search strategy used was designed to locate the islands with the shortest trees. This was accomplished by running a large number of replicates but only saving a minimum number of trees (10) per replicate. Once the islands of shortest trees are located additional swapping identifies all the equally parsimonious trees on those islands (Maddison, 1991). Confidence in the results is measured using several statistical methods. The first criterion is tree length, (i.e., number of steps) with the shortest trees being the most parsimonious (Felsenstein, 1978b). The Consistency Index (CI) is a measure of how well the data fits tree topology (Kluge and Farris, 1969). The Retention Index (RI) is a measure of the preservation of synapomorphies on a tree (Farris, 1989a). The Rescaled Consistency index (RC) is a combined index of CI and RI that allows comparison of fit between characters that reaches zero when maximum homoplasy is present (Farris, 1989b). All of the above ensemble tree scores were reported. The morphological matrix was analyzed using both equal-weighted and weighted characters. Confidence in tree topology was measured using bootstrap and decay analyses. Bootstrap involves resampling of the data matrix in each replication creating random pseudo-states for 50 percent of the characters (Felsenstein, 1985). Bootstrap provides an indication of the degree of support for a particular clade where 70 to 75 percent bootstrap is considered "good" (Sanderson, 1989). Decay (Bremmer support) is a method of analysis that seeks to find the shortest tree that is incompatible with a clade. In other words, the decay analysis determines when a clade "collapses" in longer trees (Bremer, 1988). The

decay index (d) is the number of steps required to find a tree that breaks apart a clade (where the clade decays) (Bremer, 1994).

Equal-Weighted Analysis

The morphological matrix was first analyzed with every character having a weight of "1." This equally weighted analysis is often referred to as an "unweighted" analysis. The assumption is that all characters have equal complexity or importance.

Equal-weighted tree search

The initial equal-weighted heuristic search criterion was set for maximum parsimony. All characters had weight of 1 and were unordered. Of the 82 characters in the matrix, 81 are parsimony-informative and one was parsimony-uninformative. Non-applicable (n/a) character states are treated as "missing." Multi-state taxa interpretation depends on"(and)" versus "{or}" designation. The starting trees for the heuristic search are obtained via stepwise addition using random addition sequence. One tree was held at each step during stepwise addition for each of the 1000 replicates. The branch-swapping algorithm selected was subtree-pruning-regrafting (SPR). The steepest descent option not selected. No more than 10 trees of score (length) greater than or equal to 631 were saved in each replicate. If maximum branch length was zero, then the branches were collapsed creating polytomies. The MULTREES option was selected to save all the most parsimonious trees. Topological constraints were not enforced during the search and the trees were unrooted (the search criterion requires unrooted trees).

Since the initial search limited the number of trees saved to 10 per replicate, additional branch swapping was required to find all the equally-parsimonious trees of

that length. The shortest trees saved in the first round of 1000 replicates were then swapped to completion to find all the trees of that length. The starting trees were arbitrarily dichotomized by PAUP before branch swapping.

Equal-weighted decay analysis

AutoDecay (Eriksson, 1998) was used to construct a PAUP command file of 63 constraint trees. The number of constraint trees is determined by AutoDecay based on the number of taxa and the results of the previous tree search. The PAUP analysis was run for 100 replicates for each constraint tree using the HSEARCH parameters ADDSEQ=random, NREPS=100, RSEED=1, NCHUCK=10, and CHUCKSCORE=222. The results of these searches are saved in a log file that is extracted by AutoDecay. The output of the AutoDecay extraction is a text file of decay values and a tree file. Tree files can be viewed and printed with the TreeView software package (Page, 1996).

Equal-weighted bootstrap analysis

A bootstrap analysis replaces 50 percent of the characters with character states randomly selected from the matrix. A heuristic search follows each of the 1000 replicates of random replacement. The same parameters are used as the tree search except the number repetitions of heuristic random addition is reduced to 10 and the branch-swapping algorithm was changed to nearest-neighbor interchange (NNI). A bootstrap analysis produces a majority rule consensus tree that indicates the percentage that each clade was present following each round of replacement.

Weighted Analysis

A weighted analysis is used to reduce the effect of parallelisms and reversals by estimating the phylogenetic value of each character. Homoplasious characters are down-weighted from the base value. This technique is useful to reject some equally-parsimonious trees but can result in longer trees.

Weighted tree search

The trees from the equal-weighted search were used to assign weights to each character in the matrix (Table 2-2). These initial characters were reweighted using a base weight of 1000 based on the maximum value of Rescaled Consistency (RC) indices. This index is a combination of the Consistency Index (CI) and the Retention Index (RI). The search parameters were the same as used for the equal-weighted tree search. The weighted trees collected after the 1000 replicates were then swapped to completion.

Weighted decay analysis

The weighted decay analysis used the same protocol as the equal-weighted decay analysis. The base weight of 1000 was used to adjust the results for comparison. Since a weighted decay analysis uses different values for each step, the decay values are not whole numbers.

Weighted bootstrap analysis

A bootstrap analysis of 1000 replicates using a heuristic search was conducted on the weighted matrix. The search parameters used were the same as for the equal-weighted bootstrap except simple weighting was used for this analysis.

Morphological Results

The results of the morphological analysis are given as trees scores and tree topologies. Only a strict consensus tree is presented for the equal-weighted analysis. Both an individual tree and a strict consensus tree are presented for the weighted analysis.

Equal-weighted Results

The initial tree search found 90 equally parsimonious trees. When these trees were swapped to completion, 32,700 equally parsimonious trees with a length of 631 steps were identified. The parsimony tree scores for these topologies were: CI = 0.225, RI = 0.619, and RC = 0.139. The strict consensus of these trees is found in Figure 2-56.

Weighted Results

The initial weighted tree search found 204 equally parsimonious trees. The characters were successively reweighted until the weights stabilized (4 rounds). When these trees were swapped to completion 20 equally parsimonious trees were identified. The parsimony tree scores for these topologies were: Length (L) = 665 steps, CI =

0.214, RI = 0.592, and RC = 0.126. The strict consensus of these trees is shown in Figure 2-57. The support for these trees was measured using bootstrap, and decay values. Figure 2-58 is a randomly selected tree showing individual branch lengths.

Morphological Discussion

Early classification schemes relied solely on floral morphology using a subjective phenetic approach (Swartz, 1800; Richard, 1818; Lindley, 1826). Vegetative characters were not used for classification until the work of Pfitzer (1819). Morphological characters from pollen, seeds and anatomy have only recently been introduced (Dressler and Dodson, 1960). Initial attempts at using parsimony analysis for morphological data proved less than satisfactory (Burns-Balogh and Funk, 1986). This was partially caused by misplacement and misinterpretation of character states (Dressler, 1987). There is a large amount of convergence and parallelism in both floral and vegetative characteristics in Orchidaceae (Pridgeon, et al., 1999). A recent cladistic study of Orchidaceae based on morphology supported the recognized subfamilies as monophyletic but provided poor resolution at tribal levels (Freudenstein and Rasmussen, 1999). Robert L. Dressler said, "This is a bad time to offer hypotheses about orchid phylogeny based only on morphology" (Pridgeon, et al., 1999). Although homoplasy itself is not bad, the pattern of homoplasy in morphological characters may obscure relationships in the orchid family. However, synthesis of morphological and DNA data sets is expected to yield a maximally informative data set (Freudenstein and Rasmussen, 1999).

The equally-weighted analysis of the morphological matrix produced very little resolution in the subtribe (Laeliinae). This may be due to a small number of characters or the homoplasious nature of the characters at the specific level. Generic level studies

of Laeliinae using generalized characters produce better resolution (Higgins, 1997). The weighted analysis produced good resolution (with support) for the five sections of *Encyclia* (Figure 2-57). The two exceptions are the placement of *Encyclia kienastii* and *E. subulatifolia*. *Meiracyllium* falls between *Encyclia subulatifolia* and the rest of *Encyclia* section *Leptophyllum*. *Encyclia kienastii* is positioned sister to sections *Osmophytum*, *Euchile*, *Encyclia*, and *Dinema*. *Hagsatera* is the sister group of section *Osmophytum*. However, these placements have weak bootstrap and decay support. Resolution of *Encyclia sensu* Dressler as a clade is not supported.

The weighted analysis produced trees that are 34 steps longer than equally weighted analysis. Real data sets may contain unreliable characters that do not contain phylogenetic information as well as cladistically reliable characters. Successive weighting is expected to produce a good estimate of the true tree (Farris, 1969). Since the equal-weighted analysis produced an excessive number of equally parsimonious trees, the matrix must contain a number of unreliable and homoplasious characters. Examination of the branch lengths on the individual tree (Figure 2-58) revealed that the polytomies in the strict consensus tree are in areas with short branch lengths.

Previous classifications based on phenetic groupings, often using a very limited number of characters and are not supported using modern techniques. It is easy to document errors in traditional classification (Dressler, 1990). For example, Dressler's (1961; 1971) circumscription of *Encyclia* is not supported using a parsimony analysis of morphological data. The weak support for the morphological phylogeny is most likely due to homoplasy in the character states and the relatively few characters used. The morphological analysis was used to augment the DNA analysis to clarify phylogenetic relationships.

Table 2-1. Morphological characters and character states used in cladistic analysis.

	Character	Character States
1	Plant Habit	0= caespitose; 1=creeping
2	Pseudobulb	0=absent; 1= present
3	Plant Size	0=small (<25cm); 1= large (>25cm)
4	Stem Shape	0=stem; 1=cane
5	Pseudobulb Spacing	0=clustered; 1=spaced; 2=superposed
6	Pseudobulb Base	0=not stipitate; 1=stipitate
7	Pseudobulb Surface	0=smooth; 1=wrinkled; 2=ridged or grooved; 3=sandy
8	Pseudobulb Circumference	0=not flattened; 1=flattened
9	Pseudobulb Interior	0=soild; 1=hollow
10	Pseudobulb Content	0=homoblastic; 1=hetroblastic
11	Pseudobulb Shape	0=cylindrical; 1=spindle-shaped; 2=ellipsoid ;3=ovoid; 4=conic-ovoid
12	Pseudobulb Size	0=small (<7cm); 1=large (>7cm)
13	Pseudobulbils	0=absent; 1= present
14	Ovary	0=jointed; 1=not jointed
15	Leaf Type	0=fleshy; 1=intermediate; 2=grass-like
16	Leaf Position	0=distichous; 1=terminal
17	Leaf Shape	0=linear; 1=oblong elliptic; 2=terete; 3=linear elliptic
18	Leaf Width	0=narrow (<2.5cm); 1=broad (>2.5cm)
19	Leaf Surface	0=conduplicate; 1= flat; 2=terete
20	Leaf Posture	0=flexible; 1= rigid
21	Leaf Margin	0=entire; 1=erose-dentate
22	Leaf Number	0=one; 1=two; 2=three; 3=four+
23	Leaf Length to Stem	0=shorter; 1=longer
24	Flavonoid Crystals	0=absent; 1= present
25	General Capsule Shape	0=uniform; 1=3-winged or triangular
26	Specific Capsule Shape	0=ellipsoid; 1=ovoid; 2=triangular; 3=3-winged
27	Capsule Suture Strap	0=absent; 1=present
28	Capsule Apex	0=not beaked; 1=beaked
29	Capsule Surface	0=smooth; 1=warty; 2=ribbed; 3=muricate
30	Inflorescence Form	0=simple; 1=fasciculate; 2=scorpoid
31	Inflorescence Type	0=raceme; 1=panicle; 2=sessile
32	Inflorescence Position	0=terminal; 1=lateral
33	Inflorescence Length	0=less than leaf; 1=more than leaf
34	Floral Spathe	0=present; 1=absent
35	Flower Position	0=nonresupinate; 1= resupinate
36	Flower Number	0=few: one to three; 1=many: four or more
37	Flower Size	0=small (<2.5cm); 1=large (>2.5cm)
38	Flower Veins Colored	0=no; 1=yes
39	Flowering Pseudobulb Stage	0=mature; 1=immature
40	Reflower Old Inflorescence	0=no; 1=yes
41	Floral Nectary	0=absent; 1= present
42	Column Foot	0=absent; 1= present
43	Column Posture	0=straight; 1= curved
44	Column Size	0=stout; 1=enlongate
45	Column Wings	0=absent; 1=present
46	Column Midtooth Appendage	0=absent; 1=present
47	Column Midtooth Shape	0=truncate; 1=obtuse; 2=deltoid; 3=lanceolate; 4=frimbrate
48	Column Midtooth Relative Size	0=small; 1=large
49	Column Mid/lateral-tooth Length	0=shorter; 1=equal; 2=longer

Table 2-1—continued.

	Character	Character States
50	Column Lateral-tooth Shape	0=truncate; 1=obtuse; 2=deltoid; 3=lanceolate; 4=frimbrate; 5=hooked; 6=wing-like
51	Column Sinuses	0=shallow; 1=deep
52	Column Midtooth on Anthercap	0=appressed; 1=not appressed
53	Antercap Position	0=terminal; 1=top; 2=bottom
54	Anthercap to Midtooth Length	0=subequal; 1=protrudes
55	Pollinia Number	0=two; 1=four; 2=six; 3=eight; 4=twelve
56	Pollinia Shape	0=not flattened; 1=flattened
57	Pollinia Size	0=equal; 1=unequal
58	Pollinia Attachment	0=stipe; 1=caudicle; 2=none
59	Rostellum Center	0=not thickened; 1=thickened
60	Rostellum Position	0=horizontal; 1=inclined; 2=vertical
61	Viscidium	0=present; 1=absent
62	Lateral Sepals Fusion	0=free; 1=fused
63	Lateral Sepal Fusion Amount	0=none; 1=connate at base; 2=connate
64	Sepal to Petal Length	0=equal; 1=longer
65	Sepals and Petals Margin	0=not undulate; 1=undulate
66	Sepals and Petals Shape	0=not similar; 1=similar
67	Sepals to Petals Width	0=narrower; 1=similar; 2=wider
68	Lip Adnation to Column	0=free; 1=partially adnate; 2=adnate
69	Lip Adnation	0=free; 1=partially adnate; 2=basally adnate; 3=less than half; 4=more than half; 5=complete
70	Lip Lobes	0=one; 1=two; 2=three
71	Lip Configuration	0=not tubular; 1=tubular
72	Lip Attachment	0=hinged; 1=not hinged
73	Lip Transition	0=abrupt; 1=gradual
74	Side to Midlobe Size	0=equal or smaller; 1=larger
75	Lip Side Lobes to Column	0=free; 1=fused
76	Lip Side Lobe Posture	0=flat; 1=uptumed; 2=clasp column; 3=encircle column; 4=turned down
77	Lip Midlobe Plane	0=flat; 1=tubular; 2=recurved; 3=cupped; 4=reflexed
78	Lip Callus Shape	0=platform; 1=one ridge; 2=two ridges; 3=three+ keels; 4=flat 5=transverse ridges; 6=papillae; 7=absent
79	Velamen Type	0=Pluerothallus; 1=Epidendrum
80	Velamen Layers	0=one-two; 1=three-four; 2=five-six; 3=seven-eight
81	Seed Type	0=Elleanthus; 1=Epidendrum; 2=Pleurothallis
82	Root Type	0=fleshy; 1= intermediate; 2=sinewy

Table 2-2. Morphological Matrix.

Character States	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Restrepiella ophiocephala	0	0	1	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	1	1	1	1	1	1	0
Pleurothallis racemiflora	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	1	1	1	1	1	1	0
Ponera striata	0	0	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	0	0	0	0	0	0
Isochilus major	0	0	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	0	0	0	0	0	0
Epidendrum ibaguense	0	0	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	0	1	1	1	1	0
Epidendrum conopseum	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	0	1	0	0	0	0
Nidema boothii	1	1	0	n/a	1	1	1	1	0	1	2	0	0	1	1	1	0	0	0	0	0
Scaphyglottis pulchella	0	1	1	0	2	1	0	0	0	1	0	1	0	0	1	1	1	0	0	0	0
Hexisea imbricata	0	1	1	n/a	2	1	2	1	0	1	0	1	0	1	1	1	3	0	0	1	0
Reichenbachanthus species	0	0	1	1	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	0	1	2	0	2	1	0
Hexadesmia species	0	1	1	n/a	0	1	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0
Acrorchis roseola	0	0	0	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	3	0	1	1	0
Jacquiniella teretifolia	0	0	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	2	0	2	1	0
Hagsatera brachycolumna	1	1	1	n/a	2	1	1	1	0	0	2	1	0	1	1	1	3	0	1	1	0
Homalopetalum pumilio	1	1	0	n/a	1	0	3	0	0	1	0	0	0	1	0	1	1	0	0	1	0
Meiracyllium trinasutum	1	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	0	1	1	1	1	1	0
Psychilis mcconnelliae	1	1	1	n/a	1	0	2	0	0	0	0	1	0	1	1	1	0	0	0	1	1
Psychilis krugii	1	1	1	n/a	1	0	2	0	0	0	0	1	0	1	1	1	0	0	0	1	1
Broughtonia negrilensis	1	1	1	n/a	0	0	2	1	0	0	2	0	0	1	1	1	1	1	0	1	1
Tetramicra elegans	1	0	0	0	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	2	0	2	1	1
Domingoa kienastii	1	1	0	n/a	1	0	3	0	0	1	0	0	0	1	0	1	1	0	2	1	1
Cattleyopsis lindenii	1	1	0	n/a	0	0	2	1	0	0	0	0	0	1	1	1	1	0	0	1	1
Brassavola cucullata	0	0	1	0	?	?	?	?	?	?	?	1	?	1	0	1	2	0	2	1	0
Laelia rubescens	1	1	0	n/a	1	0	2	1	0	0	{23}	0	0	1	1	1	1	0	0	1	0
Myrmecophila tibicinis	1	1	1	n/a	1	0	2	0	1	1	0	1	0	1	1	1	1	1	0	1	0
Cattleya dowiana	1	1	1	n/a	1	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	0
Rhyncholaelia glauca	1	1	1	n/a	1	1	0	0	0	1	1	1	0	1	1	1	1	1	0	1	0
Cattleya forbesii	1	1	1	n/a	1	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	0
Sophronitis cernua	1	1	0	n/a	1	0	0	1	0	1	0	0	0	1	1	1	1	1	1	1	0
Laelia purpurata	1	1	1	n/a	1	0	0	0	0	0	0	1	0	1	1	1	1	1	0	1	0
Schomburgkia splendida	1	1	1	n/a	1	1	2	0	0	0	0	1	0	1	1	1	1	1	0	1	0

Table 2-2—continued.

Character States	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Restrepiella ophiocephala	1	0	0	0	1	0	0	2	0	2	0	0	0	1	0	0	0	0	0	?	1
Pleurothallis racemiflora	0	0	0	0	1	0	0	0	0	0	0	1	0	1	1	0	1	0	0	1	1
Ponera striata	3	0	0	0	1	0	0	1	1	2	{01}	0	1	1	0	0	1	0	0	1	1
Isochilus major	3	0	0	0	1	0	0	?	0	0	0	1	1	1	1	0	0	0	0	1	1
Epidendrum ibaguense	3	0	0	0	0	0	0	?	1	0	0	1	1	0	1	0	0	0	0	1	0
Epidendrum conopseum	3	0	0	0	0	0	0	?	0	0	0	1	1	1	1	0	0	0	0	1	0
Nidema boothii	0	1	0	0	0	0	0	3	0	0	0	0	0	1	{01}	0	0	1	0	0	0
Scaphyglottis pulchella	1	0	0	0	1	0	0	?	0	0	1	0	1	1	0	0	1	0	0	1	1
Hexisea imbricata	1	0	0	0	1	0	0	?	0	2	0	0	0	1	1	0	0	1	0	1	1
Reichenbachanthus species	0	1	0	0	1	0	0	?	1	2	1	0	0	1	0	0	1	0	0	1	1
Hexadesmia species	1	?	0	0	1	0	0	?	0	1	0	0	1	1	1	0	0	0	0	1	1
Acrorchis roseola	3	?	0	0	0	0	0	0	2	0	0	1	0	1	0	0	0	0	0	1	1
Jacquiniella teretifolia	3	0	0	0	1	0	0	0	1	2	0	0	0	1	0	0	0	0	0	1	1
Hagsatera brachycolumna	0	1	?	1	2	1	0	2	1	0	0	0	0	1	1	1	1	0	0	0	0
Homalopetalum pumilio	0	{01}	0	0	1	0	0	?	0	2	0	0	0	1	0	0	1	0	0	1	1
Meiracyllium trinasutum	0	1	0	0	0	0	0	2	0	2	0	0	1	1	0	0	0	0	0	0	0
Psychilis mcconnelliae	1	1	0	0	0	0	0	2	1	0	0	1	0	1	1	1	1	0	1	0	0
Psychilis krugii	1	1	0	0	0	0	0	2	1	0	0	1	0	1	1	1	1	0	1	0	0
Broughtonia negrilensis	1	1	0	0	0	0	0	2	1	0	0	1	0	1	1	1	1	0	0	1	0
Tetramicra elegans	3	1	0	0	0	0	0	2	1	1	0	1	1	1	1	0	1	0	0	0	0
Domingoa kienastii	0	0	0	0	?	0	0	?	1	0	0	1	1	1	0	1	1	0	1	1	1
Cattleyopsis lindenii	1	1	0	0	0	0	0	?	1	0	0	1	1	1	1	1	1	0	0	1	0
Brassavola cucullata	0	1	0	0	0	0	1	2	0	2	0	0	0	1	0	1	0	0	0	1	0
Laelia rubescens	0	1	0	0	0	0	0	1	1	0	0	1	1	1	1	1	0	0	0	0	0
Myrmecophila tibicinis	1	0	0	0	0	0	0	?	1	0	0	1	1	1	1	1	1	0	0	0	1
Cattleya dowiana	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0
Rhyncholaelia glauca	0	1	0	0	0	0	1	2	0	0	0	0	0	1	0	1	0	0	0	1	0
Cattleya forbesii	1	0	0	0	0	0	0	0	0	0	0	0	0	1	{01}	1	1	0	0	1	0
Sophronitis cernua	0	1	0	0	0	0	0	?	0	2	0	0	1	1	1	0	0	1	0	1	0
Laelia purpurata	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0
Schomburgkia splendida	1	0	0	0	0	0	0	?	1	0	0	1	0	1	1	1	1	0	0	0	0

Table 2-2—continued.

Character States	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Restrepiella ophiocephala	0	0	0	0	1	0	1	1	0	0	0	0	1	0	0	1	0	2	?	1	2
Pleurothallis racemiflora	1	0	0	0	3	0	0	3	1	0	0	0	0	0	0	2	0	2	0	1	2
Ponera striata	1	0	0	0	1	0	2	1	0	0	0	1	1	1	0	2	0	?	0	1	1
Isochilus major	0	1	0	0	1	0	0	1	0	0	0	1	1	1	0	1	0	1	0	1	2
Epidendrum ibaguense	0	1	0	0	4	0	1	4	1	0	1	0	1	0	0	2	0	0	0	0	0
Epidendrum conopseum	1	1	0	0	2	0	1	2	0	0	0	0	1	0	0	2	0	0	0	0	0
Nidema boothii	1	1	0	0	2	0	1	6	1	0	0	1	1	1	1	1	0	2	1	0	0
Scaphyglottis pulchella	0	1	0	0	1	0	2	1	0	0	2	0	2	1	0	1	0	1	1	1	1
Hexisea imbricata	0	0	0	0	2	0	0	2	0	0	0	1	1	1	0	1	0	1	0	1	1
Reichenbachanthus species	0	1	0	0	1	0	1	1	0	0	0	0	1	0	0	1	0	1	0	1	1
Hexadesmia species	0	?	1	0	?	0	1	?	0	0	0	0	2	?	0	1	0	2	1	0	0
Acrorchis roseola	0	?	0	0	0	0	2	1	0	0	0	1	1	1	0	1	0	2	1	1	1
Jacquiniella teretifolia	0	0	0	0	0	0	1	1	0	0	0	0	1	1	1	2	0	2	1	0	0
Hagsatera brachycolumna	0	0	0	0	1	0	1	1	0	0	0	0	3	1	0	1	1	2	0	0	0
Homalopetalum pumilio	0	1	1	0	2	1	2	0	1	0	0	0	1	1	1	1	0	0	1	1	1
Meiracyllium trinasutum	0	0	0	0	3	0	0	3	1	0	1	1	3	0	1	1	0	0	0	0	0
Psychilis mcconnelliae	0	1	0	0	2	0	1	1	0	0	0	0	1	1	0	1	1	2	1	0	0
Psychilis krugii	0	1	0	0	2	0	1	1	0	0	0	0	1	1	0	1	1	2	1	0	0
Broughtonia negrilensis	0	1	1	0	1	0	1	1	0	0	0	0	1	1	1	1	1	2	1	0	0
Tetramicra elegans	0	?	1	0	1	0	0	3	0	0	0	0	3	1	1	1	1	2	1	0	0
Domingoa kienastii	1	?	1	0	1	0	0	1	1	0	0	0	1	1	0	?	1	2	1	0	0
Cattleyopsis lindenii	0	1	1	0	1	0	0	1	0	0	0	1	3	1	1	1	0	2	1	0	0
Brassavola cucullata	0	0	0	0	4	1	1	4	1	0	0	0	4	1	1	1	0	2	1	0	0
Laelia rubescens	0	1	0	0	3	1	2	2	1	0	0	0	3	1	0	1	1	2	1	0	0
Myrmecophila tibicinis	0	1	0	0	2	0	1	2	0	0	0	1	3	1	0	2	1	2	1	0	0
Cattleya dowiana	0	1	0	0	1	0	1	1	0	0	0	1	1	1	0	0	0	2	1	0	0
Rhyncholaelia glauca	0	1	0	0	4	1	2	4	1	0	0	0	3	1	1	1	1	2	1	0	0
Cattleya forbesii	0	1	0	0	1	0	1	1	0	0	0	1	1	1	0	0	0	2	1	0	0
Sophronitis cernua	1	0	1	0	2	1	2	5	1	0	0	0	3	1	?	1	0	1	1	0	0
Laelia purpurata	0	1	0	0	1	0	1	1	0	0	0	1	3	1	0	1	0	2	1	0	0
Schomburgkia splendida	1	1	0	0	0	0	1	3	0	0	0	1	3	1	0	1	1	2	1	0	0

Table 2-2—continued.

Character States	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82
Restrepiella ophiocephala	1	0	0	?	0	0	2	0	0	1	0	0	1	0	2	0	1	2	1
Pleurothallis racemiflora	1	0	0	2	0	0	0	0	0	1	n/a	n/a	n/a	0	3	0	1	2	2
Ponera striata	0	0	1	2	0	0	1	0	0	1	n/a	0	0	4	2	1	1	2	0
Isochilus major	1	0	1	1	0	0	2	0	0	1	0	0	1	0	3	1	?	1	0
Epidendrum ibaguense	0	0	1	1	2	5	2	0	1	0	0	0	0	0	1	1	(12)	1	1
Epidendrum conopseum	0	0	1	1	2	5	2	0	1	0	0	0	0	0	1	1	0	1	2
Nidema boothii	0	0	1	1	1	1	0	0	1	1	n/a	0	1	0	2	1	1	1	2
Scaphyglottis pulchella	0	0	1	1	0	0	0	0	0	1	0	0	0	0	2	1	?	1	?
Hexisea imbricata	0	0	1	1	0	0	0	0	1	1	n/a	0	n/a	0	0	1	2	1	1
Reichenbachanthus species	0	0	1	2	1	1	2	0	0	1	0	0	0	2	1	1	?	1	?
Hexadesmia species	0	0	1	1	0	0	1	0	0	1	n/a	0	n/a	0	?	1	?	1	?
Acrorchis roseola	0	0	1	1	1	1	2	0	1	1	0	0	1	2	5	1	?	1	?
Jacquiniella teretifolia	1	0	1	1	0	0	2	0	1	1	0	0	1	0	2	1	2	1	2
Hagsatera brachycolumna	0	0	1	1	2	4	2	0	1	1	0	0	0	4	0	1	?	1	1
Homalopetalum pumilio	0	0	1	1	1	1	0	0	0	1	n/a	n/a	n/a	0	1	1	?	1	2
Meiracyllium trinasutum	0	0	1	2	0	0	0	0	1	0	n/a	0	n/a	3	?	1	?	0	2
Psychilis mcconnelliae	0	0	1	1	2	3	2	0	1	0	0	1	1	0	0	1	2	1	1
Psychilis krugii	0	0	1	1	2	3	2	0	1	0	0	1	1	2	0	1	2	1	1
Broughtonia negrilensis	0	0	1	0	1	1	0	1	1	1	n/a	n/a	n/a	1	3	1	?	1	1
Tetramicra elegans	0	0	1	2	1	1	2	0	1	0	0	1	0	0	2	1	0	1	0
Domingoa kienastii	0	0	1	1	0	0	2	0	0	0	0	0	0	2	2	1	?	1	1
Cattleyopsis lindenii	0	0	1	1	1	1	0	1	1	1	n/a	n/a	n/a	1	0	1	?	1	1
Brassavola cucullata	0	0	1	2	1	1	0	0	1	0	n/a	0	n/a	0	3	1	2	1	1
Laelia rubescens	0	0	1	0	0	0	2	1	1	1	0	0	2	0	3	1	?	1	1
Myrmecophila tibicinis	0	1	1	1	0	0	2	1	1	1	1	0	2	0	4	1	3	1	1
Cattleya dowiana	0	0	1	0	1	1	2	1	1	1	0	0	2	1	7	1	?	1	1
Rhyncholaelia glauca	0	0	1	1	1	1	2	1	1	0	0	0	0	4	0	1	1	1	1
Cattleya forbesii	0	0	1	0	1	1	2	1	1	1	1	0	3	1	7	1	1	1	1
Sophronitis cernua	0	0	1	1	0	0	2	1	1	0	0	0	1	1	3	1	1	1	1
Laelia purpurata	0	0	1	0	0	0	0	1	1	1	?	?	3	1	3	1	2	1	1
Schomburgkia splendida	0	1	1	1	0	0	2	0	1	0	1	0	2	0	3	1	?	1	1

Table 2-2—continued.

Character States	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Encyclia citrina	1	1	0	n/a	0	0	0	0	0	0	3	0	0	1	1	1	0	0	1	0	0
Encyclia mariae	1	1	0	n/a	0	0	0	0	0	1	3	0	0	1	1	1	0	0	1	0	0
Encyclia mariae	1	1	0	n/a	0	0	0	0	0	1	3	0	0	1	1	1	0	0	1	0	0
Encyclia polybulbon	1	1	0	n/a	1	0	0	0	0	1	3	0	0	1	1	1	1	0	0	1	0
Encyclia polybulbon	1	1	0	n/a	1	0	0	0	0	1	3	0	0	1	1	1	1	0	0	1	0
Encyclia adenocaula	1	1	1	n/a	0	0	0	0	0	1	3	0	0	1	1	1	0	0	0	1	0
Encyclia bractescens	1	1	1	n/a	0	0	1	0	0	1	4	0	0	1	1	1	0	0	0	1	0
Encyclia aromatica	1	1	1	n/a	0	0	0	0	0	1	4	0	0	1	1	1	0	0	0	1	0
Encyclia cordigera	1	1	1	n/a	0	0	0	0	0	1	4	1	0	1	1	1	0	0	0	1	0
Encyclia tampensis	1	1	0	n/a	0	0	0	0	0	1	4	0	0	1	1	1	0	0	0	1	0
Encyclia tampensis alba	1	1	0	n/a	0	0	0	0	0	1	4	0	0	1	1	1	0	0	0	1	0
Encyclia dichroma	1	1	1	n/a	0	0	0	0	0	1	4	1	0	1	1	1	0	0	0	1	0
Encyclia diurna	1	1	1	n/a	0	0	0	0	0	1	4	0	0	1	1	1	0	0	0	1	0
Encyclia asperula	1	1	0	n/a	0	0	1	0	0	1	4	0	0	1	1	1	0	0	0	1	0
Encyclia candollei	1	1	0	n/a	0	0	0	0	0	1	4	0	0	1	1	1	0	0	0	1	0
Encyclia randii	1	1	1	n/a	0	0	1	0	0	1	4	0	0	1	1	1	0	0	0	1	0
Encyclia kienastii	1	1	1	n/a	1	1	2	0	0	0	0	1	0	1	1	1	1	0	0	1	0
Encyclia chimborazoensis	1	1	1	n/a	1	1	0	1	0	1	2	1	0	1	1	1	1	1	0	0	0
Encyclia fragrans	1	1	0	n/a	1	1	0	1	0	1	2	1	1	1	1	1	3	1	0	0	0
Encyclia aemula	1	1	0	n/a	1	0	1	1	0	1	3	0	0	1	1	1	1	1	0	0	0
Encyclia cochleata	1	1	1	n/a	1	1	0	1	0	1	2	1	0	1	1	1	3	1	0	0	0
Encyclia pygmaea	1	1	0	n/a	1	0	0	1	0	1	2	0	0	1	1	1	1	0	0	0	0
Encyclia pseudopygmaea	1	1	0	n/a	1	0	0	0	0	1	2	0	0	1	1	1	1	0	0	0	0
Encyclia vitellina	1	1	0	n/a	0	0	0	1	0	1	4	0	0	1	1	1	1	0	0	0	0
Encyclia glauca	1	1	0	n/a	0	0	0	1	0	1	3	0	0	1	1	1	1	0	0	0	0
Encyclia ionocentra	1	1	1	n/a	1	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0
Encyclia prismatocarpa	1	1	1	n/a	1	0	0	0	0	1	1	1	0	1	1	1	1	1	0	0	0
Encyclia ochracea	1	1	0	n/a	1	0	0	0	0	1	0	0	0	1	1	1	1	0	0	0	0
Encyclia cretacea	1	1	1	n/a	0	0	0	1	0	1	3	0	0	1	1	1	1	0	0	0	0
Encyclia luteorosea	1	1	0	n/a	0	0	0	0	0	0	3	0	0	1	2	1	0	0	1	0	0
Encyclia luteorosea	1	1	0	n/a	0	0	0	0	0	0	3	0	0	1	2	1	0	0	1	0	0
Encyclia subulatifolia	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	2	0	2	1	0

Table 2-2—continued.

Character States	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Encyclia citrina	2	1	0	1	2	0	0	0	0	0	0	1	0	1	0	1	1	0	0	1	0
Encyclia mariae	1	1	0	1	2	0	0	0	0	0	0	1	0	1	{01}	1	1	0	0	1	0
Encyclia mariae	1	1	0	1	2	0	0	0	0	0	0	1	0	1	{01}	1	1	0	0	1	0
Encyclia polybulbon	1	1	0	0	0	0	0	0	0	2	0	0	0	1	0	0	1	0	0	0	0
Encyclia polybulbon	1	1	0	0	0	0	0	0	0	2	0	0	0	1	0	0	1	0	0	0	0
Encyclia adenocaula	1	1	0	0	0	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	0
Encyclia bractescens	2	1	0	0	0	0	0	1	0	1	0	1	1	1	{01}	1	1	0	0	0	0
Encyclia aromatica	{01}	1	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	0
Encyclia cordigera	2	1	0	0	0	0	0	?	0	0	0	1	1	1	1	1	1	0	0	0	0
Encyclia tampensis	0	1	0	0	0	0	0	0	0	1	0	1	1	1	1	0	1	0	0	0	0
Encyclia tampensis alba	0	1	0	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0
Encyclia dichroma	1	1	0	0	0	0	0	?	0	1	0	1	1	1	1	1	1	0	0	0	0
Encyclia diurna	1	1	0	0	0	0	0	?	0	1	0	1	1	1	1	1	1	0	0	0	0
Encyclia asperula	0	1	0	0	0	0	0	1	0	0	0	0	1	1	{01}	0	1	0	0	0	0
Encyclia candollei	0	1	0	0	0	0	0	0	0	1	0	1	1	1	1	0	1	0	0	0	0
Encyclia randii	1	1	0	0	0	0	0	?	0	1	0	1	1	1	1	1	1	0	0	0	0
Encyclia kienastii	{12}	1	0	0	0	0	0	0	0	1	0	1	1	1	1	0	1	0	0	0	0
Encyclia chimborazoensis	1	1	1	1	3	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0
Encyclia fragrans	1	1	1	1	3	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
Encyclia aemula	1	1	1	1	3	1	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0
Encyclia cochleata	1	1	1	1	3	1	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0
Encyclia pygmaea	1	1	1	1	3	1	0	0	0	2	0	0	1	1	0	0	0	0	0	0	0
Encyclia pseudopygmaea	1	1	1	1	3	1	0	0	0	2	0	0	1	1	0	0	0	0	0	0	0
Encyclia vitellina	{12}	1	1	1	2	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Encyclia glauca	0	1	1	1	2	1	0	0	1	1	0	1	0	0	1	0	0	0	0	1	0
Encyclia ionocentra	2	1	1	1	2	1	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0
Encyclia prismatocarpa	1	1	1	1	2	1	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0
Encyclia ochracea	2	1	1	1	3	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
Encyclia cretacea	{12}	1	1	1	2	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Encyclia luteorosea	1	1	0	0	0	0	0	?	0	0	0	1	1	1	1	0	1	0	0	?	0
Encyclia luteorosea	1	1	0	0	0	0	0	?	0	0	0	1	1	1	1	0	1	0	0	?	0
Encyclia subulatifolia	3	0	0	0	0	0	0	?	0	0	0	1	1	0	0	0	1	0	0	1	0

Table 2-2—continued.

Character States	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Encyclia citrina	0	0	0	0	0	1	1	0	1	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia mariae	0	0	0	0	0	1	1	0	1	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia mariae	0	0	0	0	0	1	1	0	1	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia polybulbon	0	1	1	0	1	0	0	3	1	0	0	0	1	1	0	2	1	2	1	0	0
Encyclia polybulbon	0	1	1	0	1	0	0	3	1	0	0	0	1	1	0	2	1	2	1	0	0
Encyclia adenocaula	0	1	1	0	2	0	1	2	0	0	0	1	1	1	0	1	1	2	1	0	0
Encyclia bractescens	0	1	1	0	2	0	1	2	0	0	0	1	1	1	0	1	1	2	1	0	0
Encyclia aromatica	1	1	0	0	2	0	1	2	0	0	0	1	1	1	0	1	1	2	1	0	0
Encyclia cordigera	0	1	0	0	2	0	1	2	0	0	0	1	1	1	0	1	1	2	1	0	0
Encyclia tampensis	0	1	1	0	2	0	1	2	0	0	0	1	1	1	0	1	1	2	1	0	0
Encyclia tampensis alba	0	1	1	0	2	0	1	2	0	0	0	1	1	1	0	1	1	2	1	0	0
Encyclia dichroma	?	1	1	0	2	0	1	2	0	0	0	1	1	1	0	1	1	2	1	0	0
Encyclia diurna	?	1	1	0	2	0	1	2	0	0	0	1	1	1	0	1	1	2	1	0	0
Encyclia asperula	0	1	1	0	1	0	1	2	0	0	0	1	1	1	0	1	1	2	1	0	0
Encyclia candollei	1	1	0	0	2	0	1	2	0	0	0	1	1	1	0	1	1	2	1	0	0
Encyclia randii	?	1	1	0	1	0	1	2	0	0	0	1	1	1	0	1	1	2	1	0	0
Encyclia kienastii	1	1	0	0	1	0	0	2	0	0	0	0	1	1	0	1	1	2	1	0	0
Encyclia chimborazoensis	0	0	0	1	1	1	1	1	1	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia fragrans	0	0	0	1	1	1	1	1	1	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia aemula	0	0	0	1	1	1	1	1	1	1	0	0	1	1	0	0	1	2	1	0	0
Encyclia cochleata	0	0	0	1	1	1	0	1	1	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia pygmaea	0	0	0	1	3	1	2	2	0	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia pseudopygmaea	0	0	0	1	1	1	2	2	0	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia vitellina	0	0	0	1	0	1	0	0	1	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia glauca	1	0	0	1	0	1	2	1	1	1	0	0	1	1	0	1	1	0	1	0	0
Encyclia ionocentra	0	0	0	1	4	1	1	6	1	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia prismatocarpa	0	0	0	1	4	1	1	4	1	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia ochracea	0	0	0	1	4	1	2	4	1	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia cretacea	0	0	0	1	1	0	1	1	0	1	0	0	1	1	0	1	1	2	1	0	0
Encyclia luteorosea	0	0	0	0	1	0	1	6	0	0	1	1	1	1	0	1	0	0	0	0	0
Encyclia luteorosea	0	0	0	0	1	0	1	6	0	0	1	1	1	1	0	1	0	0	0	0	0
Encyclia subulatifolia	0	0	1	0	1	0	0	1	0	1	1	1	1	1	1	1	0	0	0	0	0

Table 2-2—continued.

Character States	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82
Encyclia citrina	0	0	1	1	2	2	2	1	1	0	0	0	0	1	2	1	2	1	1
Encyclia mariae	0	0	1	1	2	2	1	1	1	1	?	0	?	1	2	1	?	1	1
Encyclia mariae	0	0	1	1	2	2	1	1	1	1	?	0	?	1	2	1	?	1	1
Encyclia polybulbon	0	0	1	1	2	2	0	0	1	0	?	0	?	0	2	1	0	1	2
Encyclia polybulbon	0	0	1	1	2	2	0	0	1	0	?	0	?	0	2	1	0	1	2
Encyclia adenocaula	0	0	1	1	2	3	2	0	1	0	0	0	2	0	2	1	?	1	1
Encyclia bractescens	0	0	1	1	2	2	2	1	1	0	0	0	2	1	2	1	1	1	2
Encyclia aromatica	0	0	1	1	2	2	2	0	1	0	0	0	2	0	2	1	?	1	1
Encyclia cordigera	0	0	1	1	2	2	2	0	1	0	0	0	2	0	2	1	?	1	1
Encyclia tampensis	0	0	1	1	2	2	2	0	1	0	0	0	2	0	2	1	2	1	1
Encyclia tampensis alba	0	0	1	1	2	2	2	0	1	0	0	0	2	0	2	1	2	1	1
Encyclia dichroma	0	0	1	1	2	2	2	0	1	0	0	0	2	2	2	1	3	1	1
Encyclia diurna	0	0	1	1	2	2	2	0	1	0	0	0	2	0	2	1	2	1	1
Encyclia asperula	0	0	1	1	2	2	2	0	1	0	0	0	2	2	2	1	?	1	1
Encyclia candollei	0	0	1	1	2	2	2	1	1	0	1	0	2	1	2	1	3	1	1
Encyclia randii	0	0	1	1	2	2	2	0	1	0	0	0	2	0	2	1	1	1	1
Encyclia kienastii	0	0	1	1	2	2	2	0	1	0	0	0	2	0	2	1	?	1	1
Encyclia chimborazoensis	0	0	1	1	2	3	0	0	1	0	?	?	?	3	0	1	(12)	1	1
Encyclia fragrans	0	0	1	1	2	3	0	0	1	0	?	?	?	3	0	1	1	1	1
Encyclia aemula	0	0	1	1	2	3	0	0	1	0	?	?	?	3	0	1	?	1	1
Encyclia cochleata	0	1	1	1	2	3	0	0	1	0	?	?	?	3	0	1	(12)	1	1
Encyclia pygmaea	0	0	1	1	2	4	2	0	1	0	1	0	2	2	2	1	?	1	2
Encyclia pseudopygmaea	0	0	1	1	2	4	2	0	1	0	1	0	2	2	2	1	?	1	2
Encyclia vitellina	0	0	1	1	2	3	2	0	1	1	0	0	4	0	0	1	?	1	1
Encyclia glauca	0	0	1	1	2	3	2	0	1	0	0	0	1	4	0	1	1	1	1
Encyclia ionocentra	0	0	1	1	2	3	2	0	1	0	0	0	0	0	0	1	1	1	1
Encyclia prismatocarpa	0	0	1	1	2	3	2	0	1	0	0	0	0	0	0	1	?	1	1
Encyclia ochracea	0	0	1	1	2	3	2	0	1	0	0	0	1	0	0	1	1	1	1
Encyclia cretacea	0	0	1	1	2	2	2	0	1	0	0	0	1	0	3	1	?	1	1
Encyclia luteorosea	0	0	1	1	2	4	0	0	1	1	?	?	?	0	6	1	?	1	?
Encyclia luteorosea	0	0	1	1	2	4	0	0	1	1	?	?	?	0	6	1	?	1	?
Encyclia subulatifolia	0	0	1	1	2	4	0	0	1	1	?	?	?	2	6	1	0	1	1

Table 2-2—continued.

Character States	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Encyclia subulatifolia	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	2	0	2	1	0
Encyclia cyanocolumna	1	1	0	n/a	0	0	0	0	0	1	3	0	0	1	2	1	0	0	1	0	0
Encyclia tenuissima	1	1	0	n/a	0	0	0	0	0	1	3	0	0	1	2	1	0	0	1	0	0

Table 2-2—continued.

Character States	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Encyclia subulatifolia	3	0	0	0	0	0	0	?	0	0	0	1	1	0	0	0	1	0	0	1	0
Encyclia cyanocolumna	1	1	0	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	1	0
Encyclia tenuissima	1	1	0	0	0	0	0	?	0	0	0	1	1	1	{01}	0	0	0	0	1	0

Table 2-2—continued.

Character States	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Encyclia subulatifolia	0	0	1	0	1	0	0	1	0	1	1	1	1	1	1	1	0	0	0	0	0
Encyclia cyanocolumna	0	0	0	0	1	0	0	6	0	0	1	1	1	1	0	1	0	0	0	0	0
Encyclia tenuissima	0	0	0	0	1	0	0	6	0	1	1	1	1	1	0	1	0	0	0	0	0

Table 2-2—continued.

Character States	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82
Encyclia subulatifolia	0	0	1	1	2	4	0	0	1	1	?	?	?	2	6	1	0	1	1
Encyclia cyanocolumna	0	0	1	1	2	3	0	0	1	1	?	?	?	0	6	1	1	1	1
Encyclia tenuissima	0	0	1	1	2	4	0	0	1	1	?	?	?	0	6	1	?	1	1

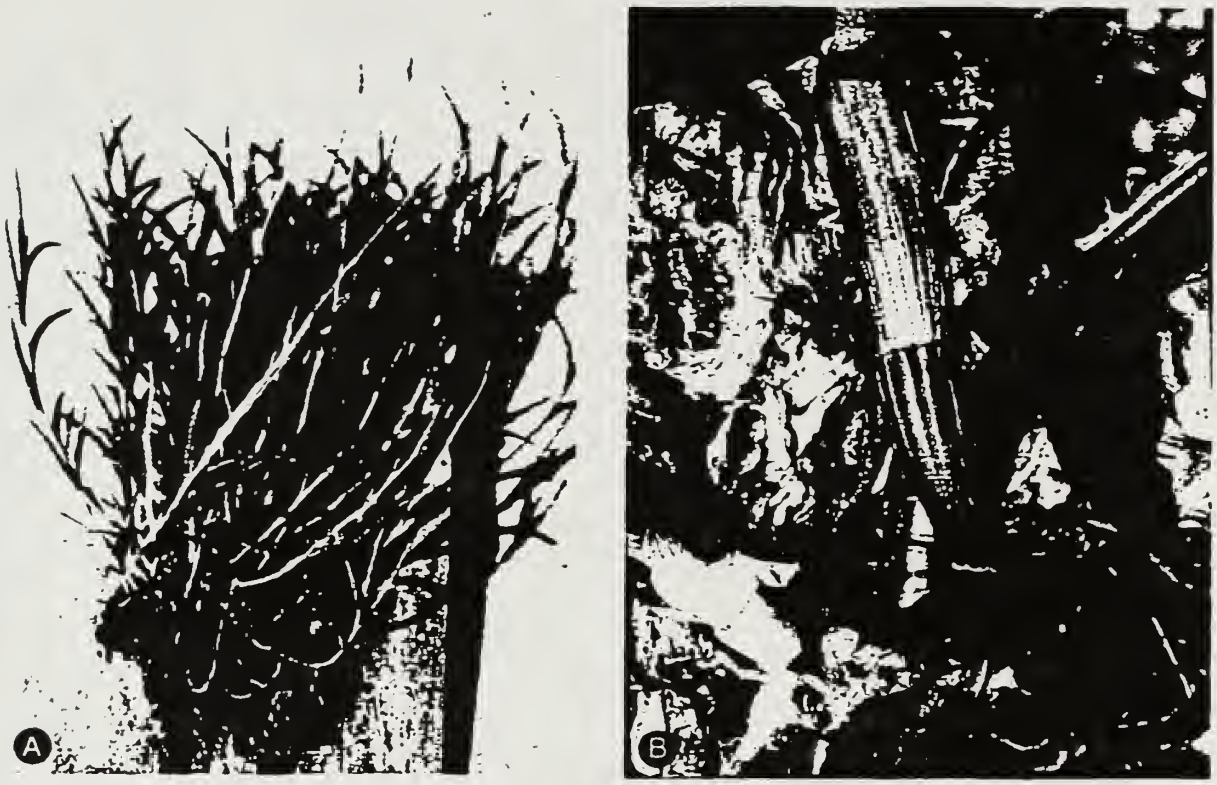

Figure 2-1. Plant Habit: A. caespitose habit of *Jacquiniella teretifolia*; B. creeping habit of *Rhyncholaelia glauca*.

Figure 2-2. Stem Shape: A. pencil-like in *Brassavola cucullata*; B. cane-like in *Epidendrum subulatifolium*.

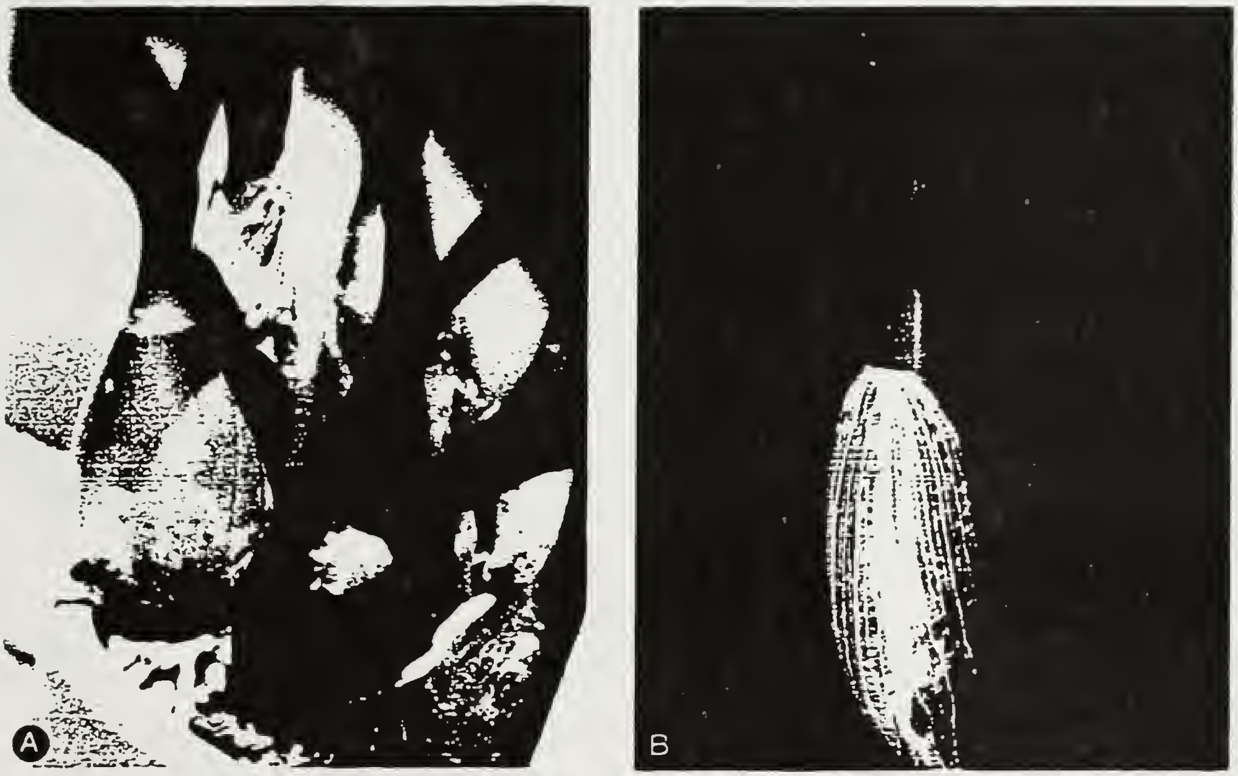

Figure 2-3. Pseudobulb Circumference: A. round in *Encyclia hanburii*; B. flattened in *Prosthechea livida*.

Figure 2-4. Pseudobulb Base: A. not stipitate in *Encyclia tampensis*; B. stipitate in *Prosthechea livida*.

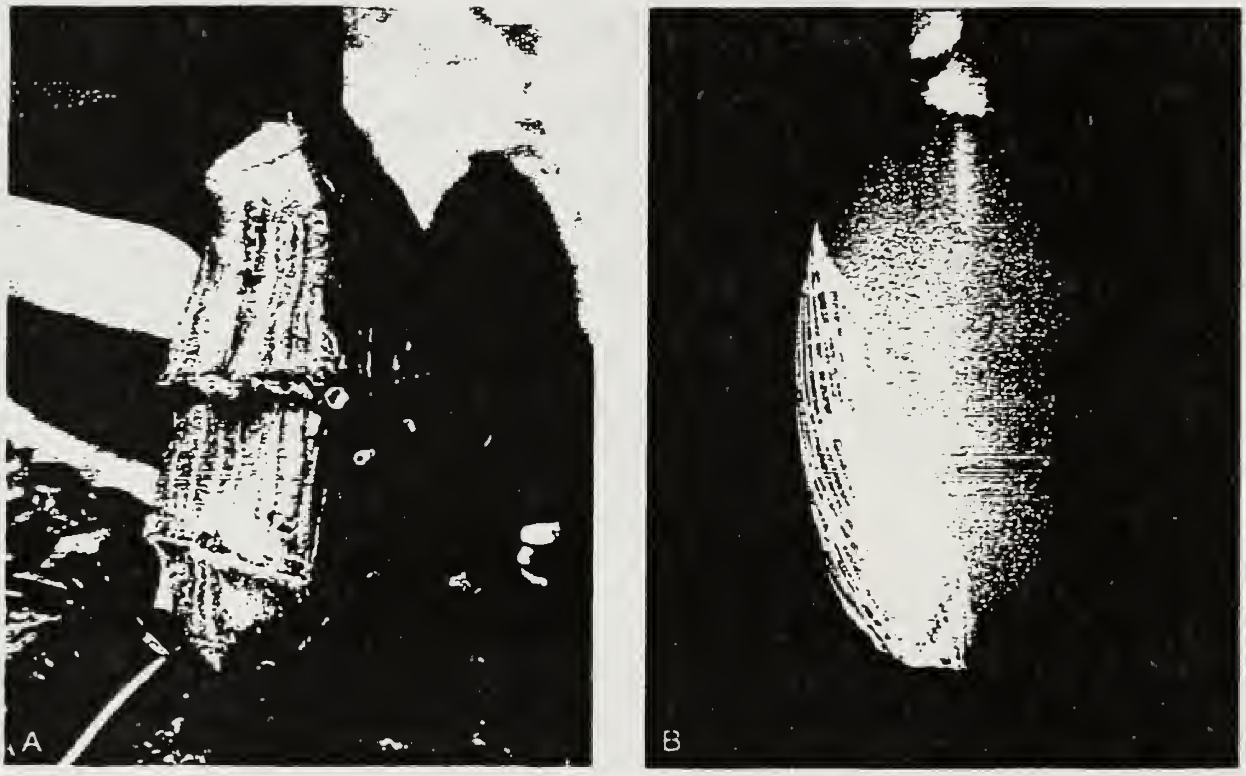

Figure 2-5. Pseudobulb Internode: A. homoblastic in *Broughtonia negrilensis*; B. heteroblastic in *Prosthechea livida*.

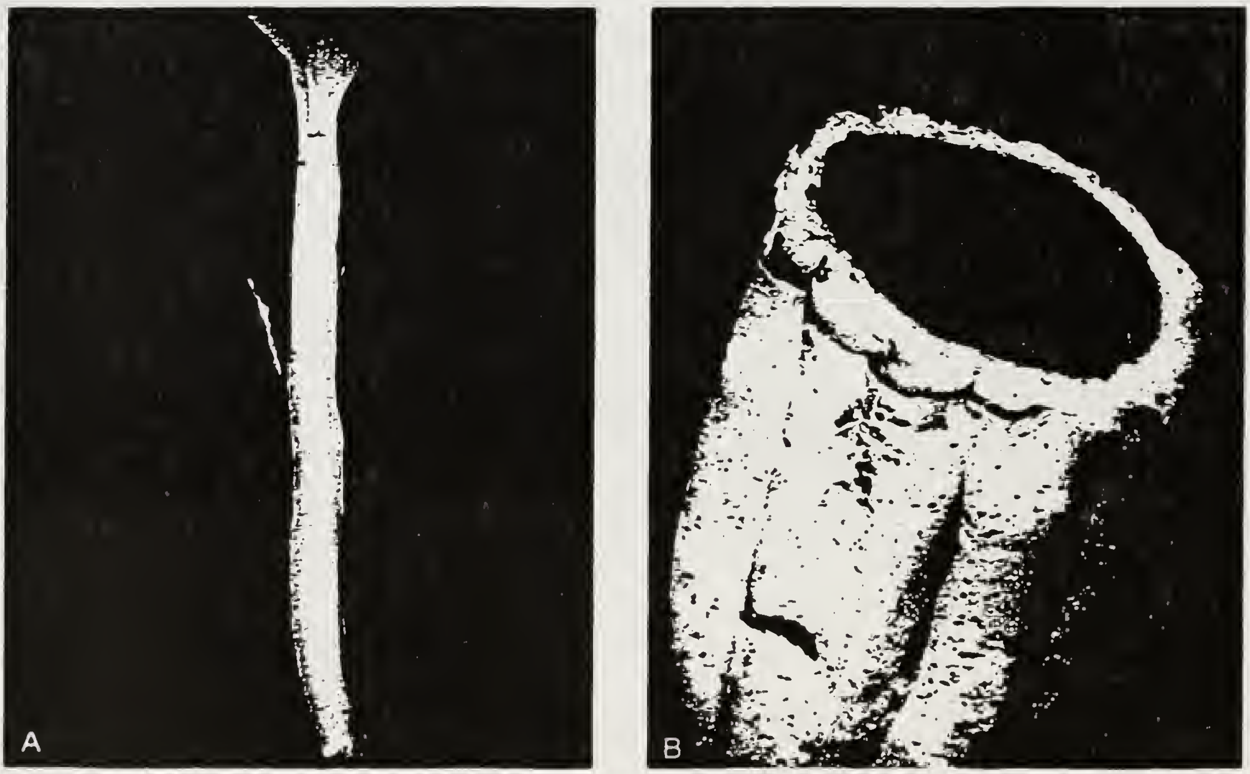

Figure 2-6. Pseudobulb Interior: A. solid in *Cattleya forbesii*; B. hollow in *Myrmecophila tibicinis*.

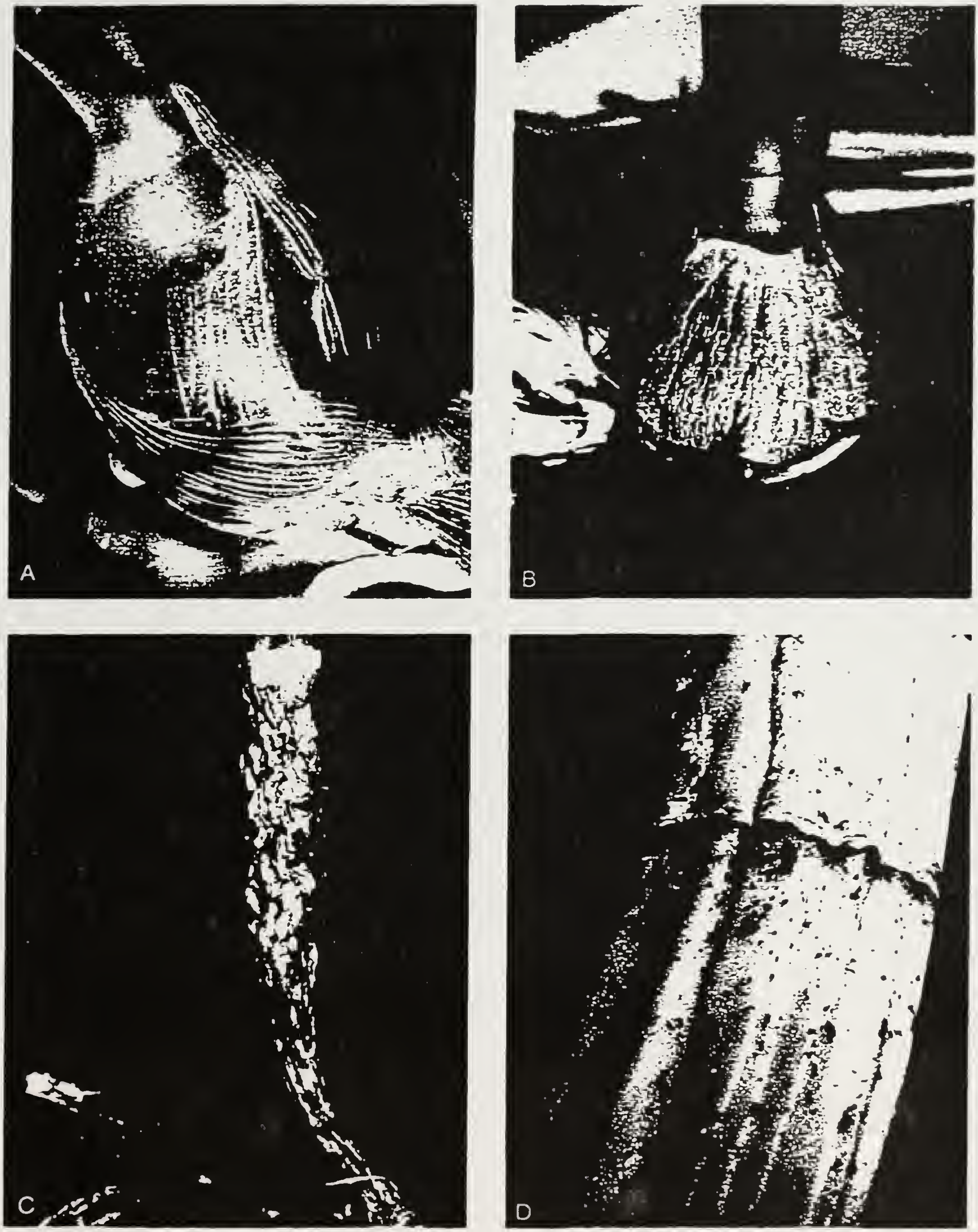

Figure 2-7. Pseudobulb Surface: A. smooth in *Dinema polybulbon*; B. wrinkled in *Encyclia randii*; C. rough in *Domingoa kienastii*; D ribbed in *Myrmechophila tibicinis.*

Figure 2-8. Pseudobulbil: Present in *Prosthechea livida*.

Figure 2-9. Pseudobulb Shape:
A. cylindrical in *Cattleya bowringiana*.

Figure 2-9. Pseudobulb Shape—continued: B. ellipsoid in *Laelia speciosa*; C. spindle-shaped in *Rhyncholaelia glauca*; D. ovoid in *Euchile citrina*; E. conic-oviod in *Encyclia phoenicea*.

Figure 2-10. Leaf Position: A. distichous in *Epidendrum ibaguense*; B. Terminal in *Encyclia handurii.*

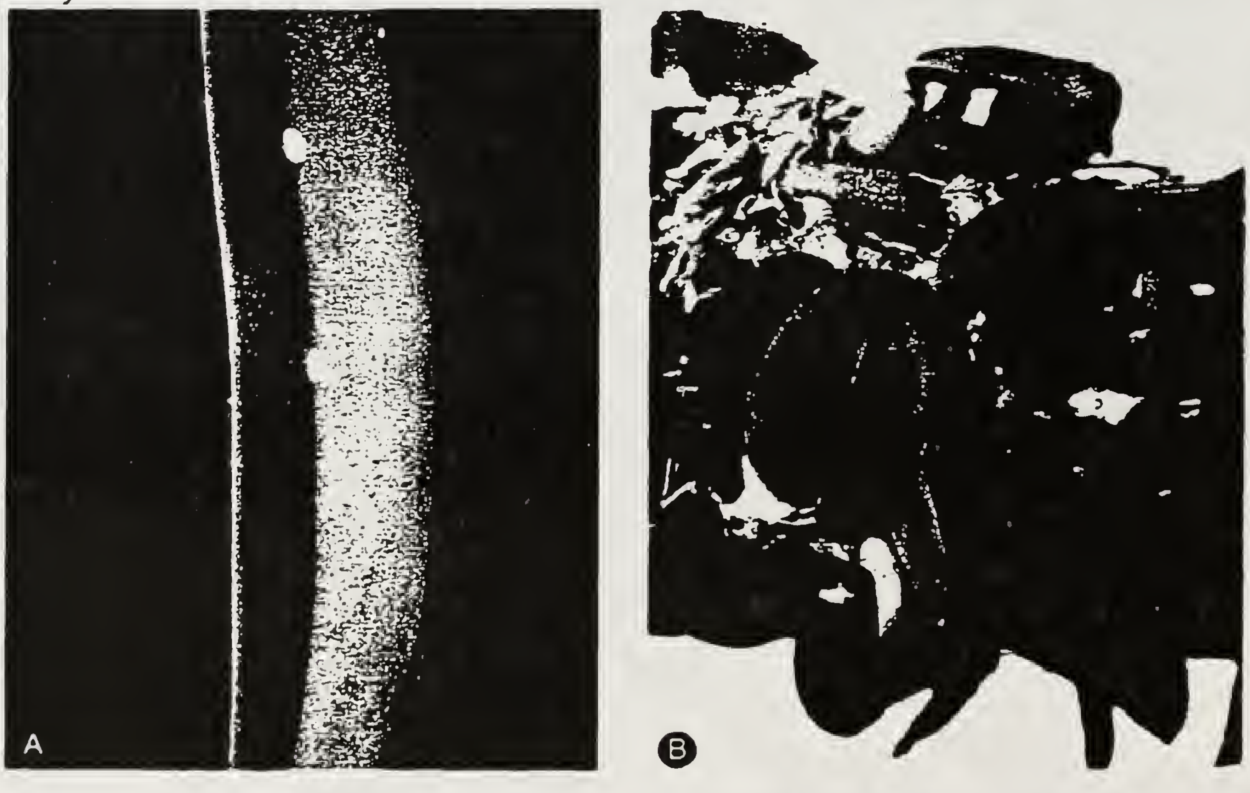

Figure 2-12. Leaf Surface: A. conduplicate in *Myrmecophila tibicinis*; B. flat in *Sophronitis cernua.*

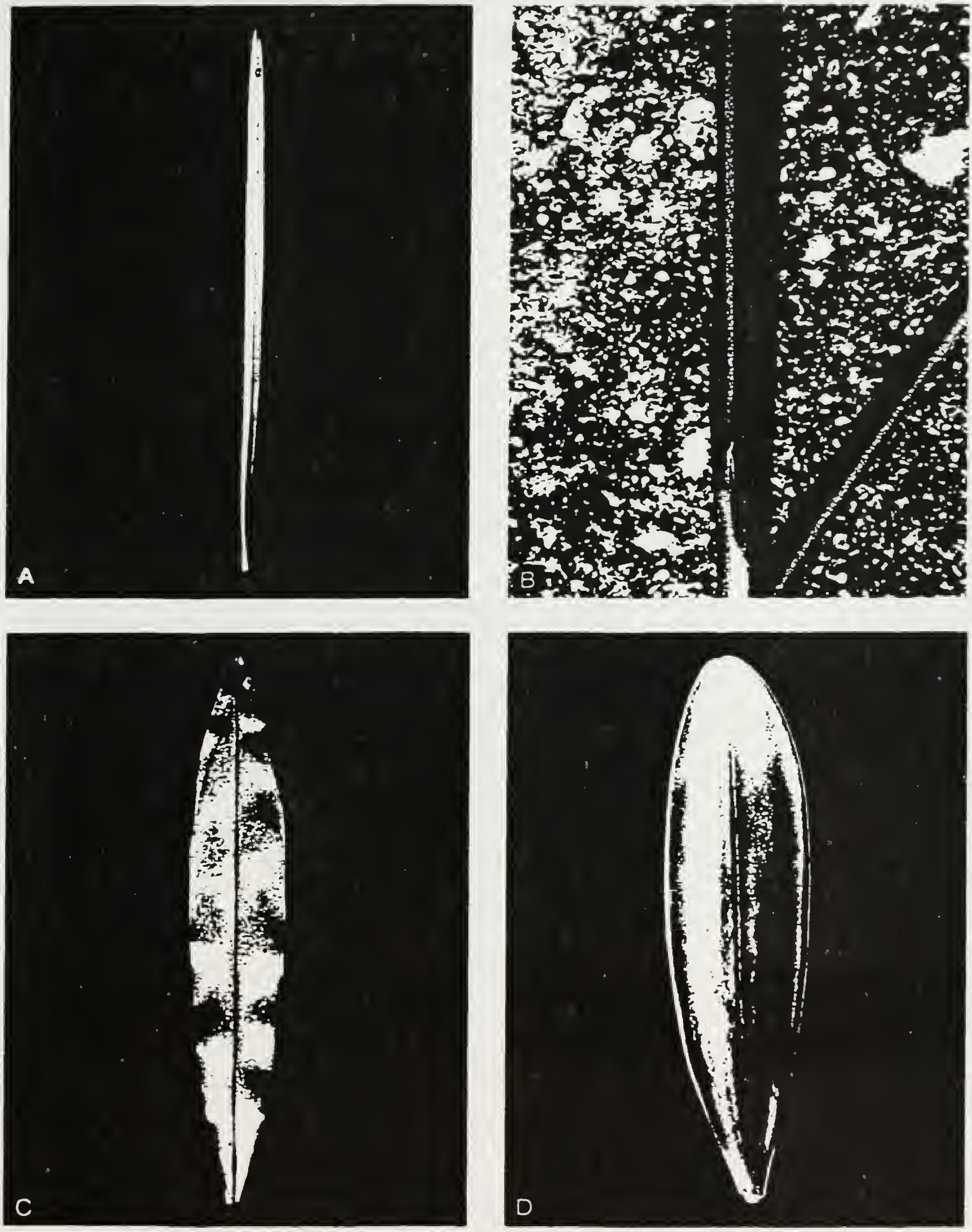

Figure 2-11. Leaf Shape: A. linear in *Encyclia cyanocolumna*; B. terete in *Brassavola cucullata*; C. linear-elliptic in *Prosthechea chimborazoensis*; C. oblong-elliptic in *Pleurothallis racemiflora*.

Figure 2-13. Leaf Posture: A. rigid in *Encyclia steinbachii*; B. flexible in *Prosthechea baculus*.

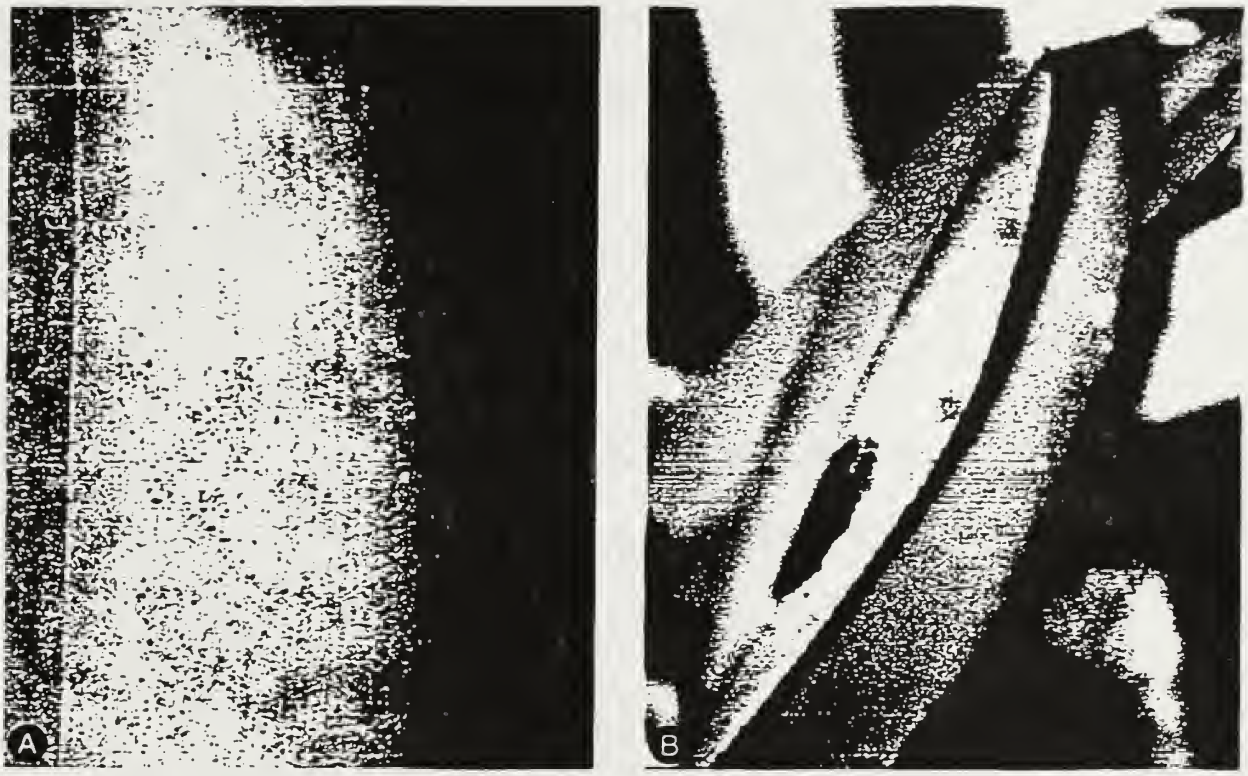

Figure 2-14. Leaf Margin: A. entire in *Cattleya forbesii*, B. erose-dentate in *Broughtonia negrilensis*.

Figure 2-15. Velamen: *Epidendrum* type in *Encyclia amanda*.

Figure 2-16. Spathe: A. present in *Prosthechea boothiana*; B. absent in *Encyclia tampensis*.

Figure 2-17. Inflorescence Form: A. simple in *Prosthechea boothiana*; B. scorpioid in *Isochilus linearis*; C. fasciculate in *Encyclia adenocaula*.

Figure 2-18. Inflorescence Type: A. sessile in *Dinema polybulbon*; B. raceme in *Pleurothallis racemiflora*; C. panicle in *Encyclia profusa*.

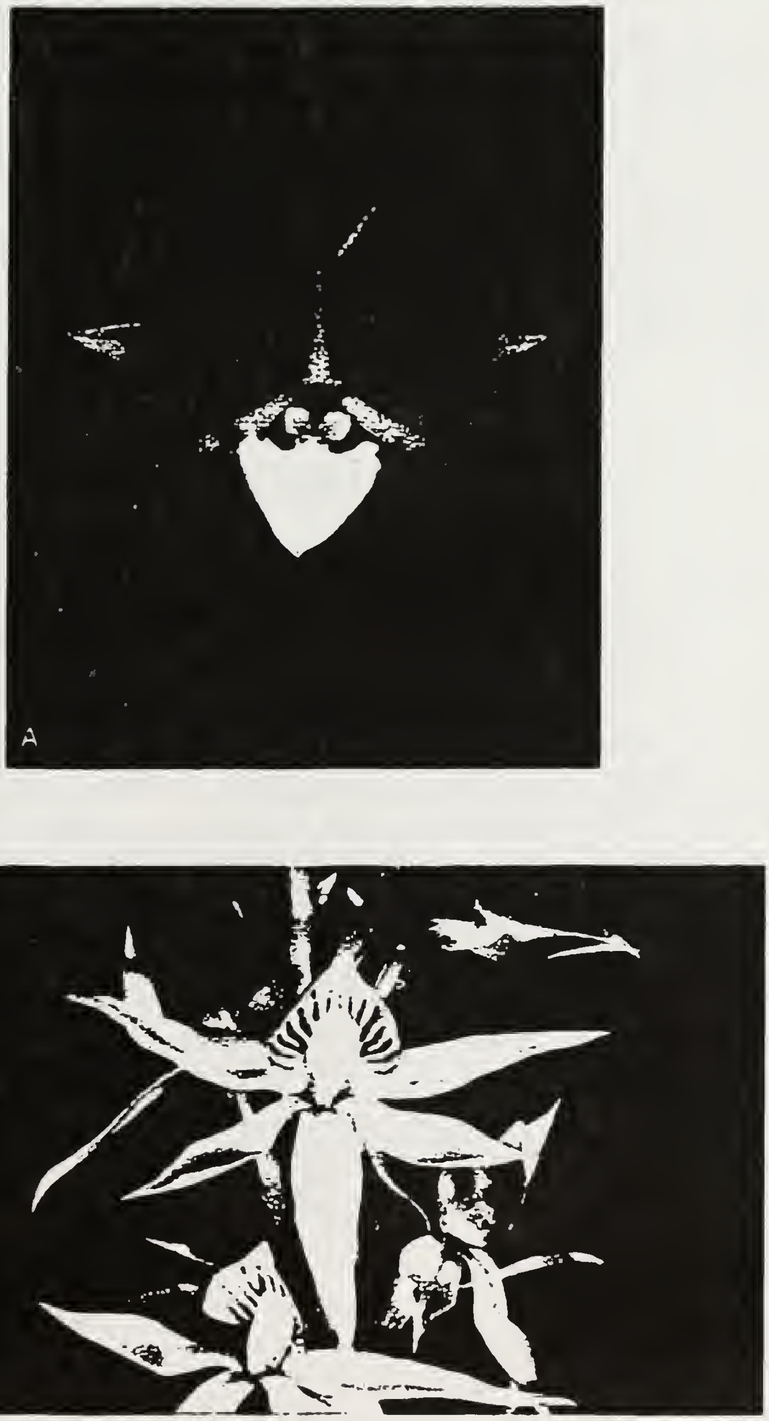

Figure 2-19. Flower Orientation: A. resupinate in *Encyclia bractescens*; B. non-resupinate in *Prosthechea trulla*.

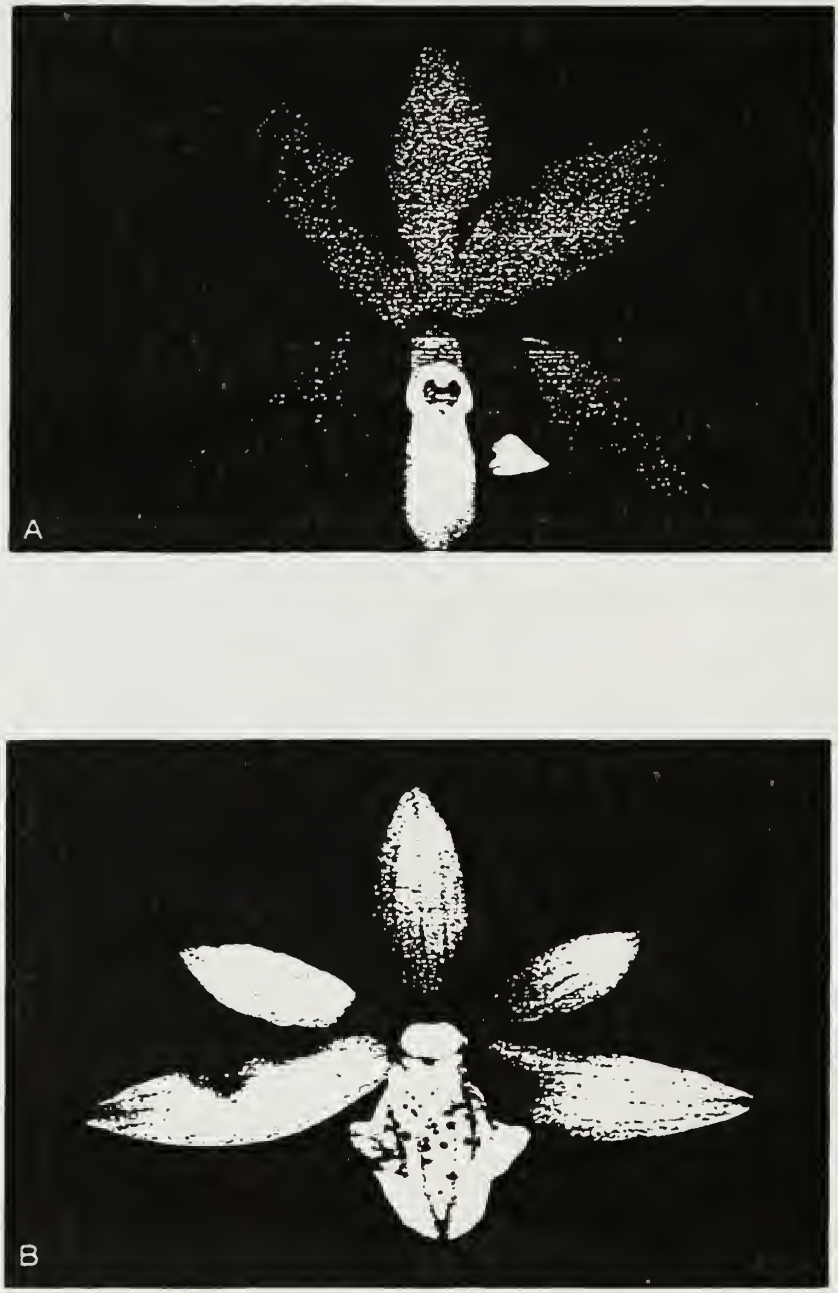

Figure 2-20. Flower Striations: A. not visible in *Prosthechea vitellina*; B. visible in *Encyclia tenuissima* .

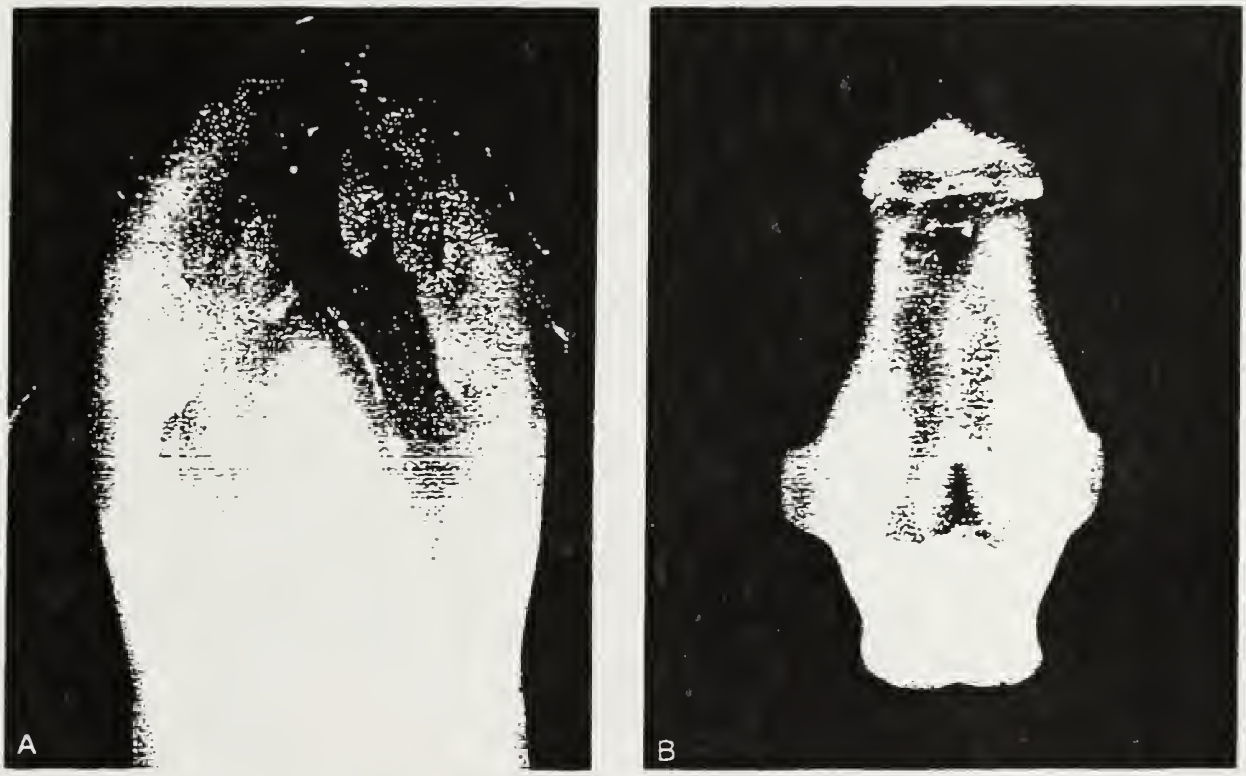

Figure 2-21. Nectary: A. present in *Euchile mariae*; B. absent in *Encyclia phoenicea*.

Figure 2-22. Pseudobulb Maturity: A. immature in *Nidema boothii*; B. mature in *Sophronitis cernua*.

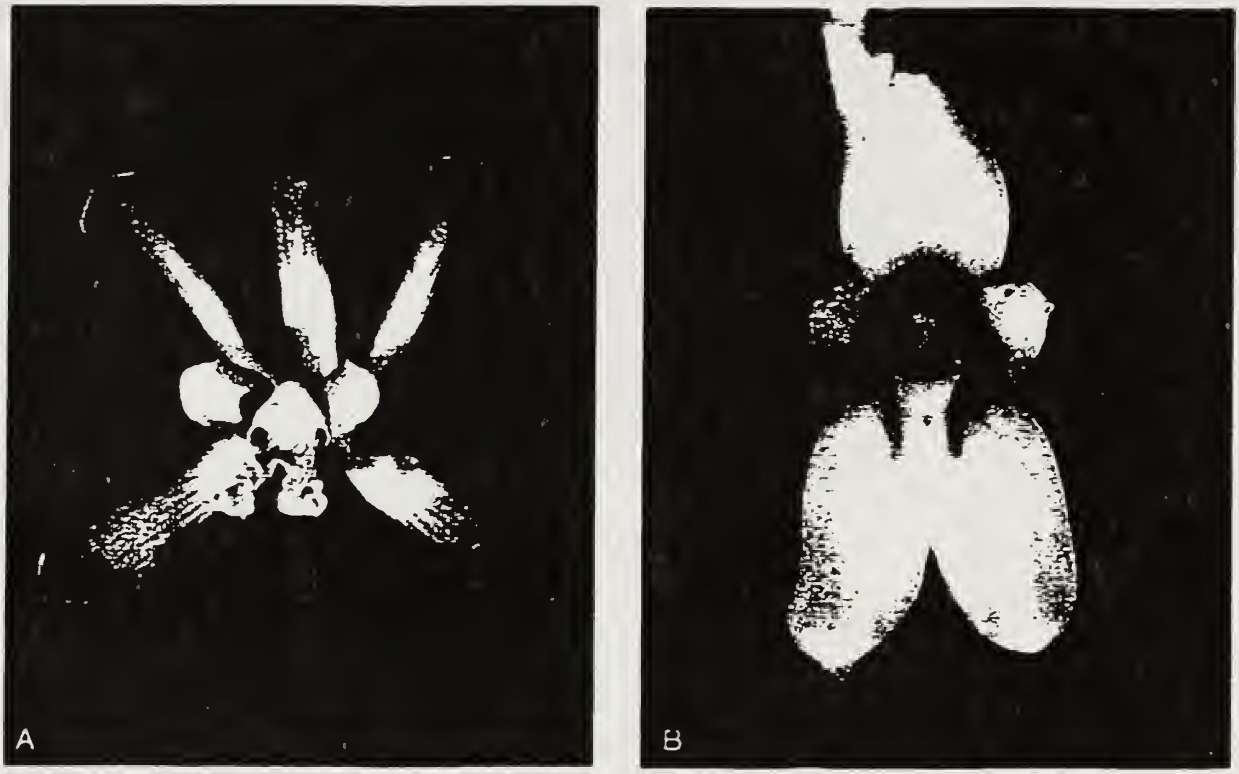

Figure 2-23. Sepal Fusion: A. free in *Encyclia belizensis*; B. fused in *Pleurothallis racemiflora*.

Figure 2-24. Sepal Length: A. equal in *Encyclia asperula*; B. shorter in *Pleurothallis racemiflora*.

Figure 2-25. Petal to Sepal Width Ratio: A. wider in *Laelia purpurata*; B. equal in *Cattleya forbesii*.

Figure 2-26. Sepal and Petal Margins: A. not undulate in *Euchile mariae*; B. undulate in *Myrmecophila tibicinis*.

Figure 2-27. Lip Adnation: A. partially fused (½) in *Prosthechea tripunctata*; B. completely fused in *Epidendrum ibaguense.*

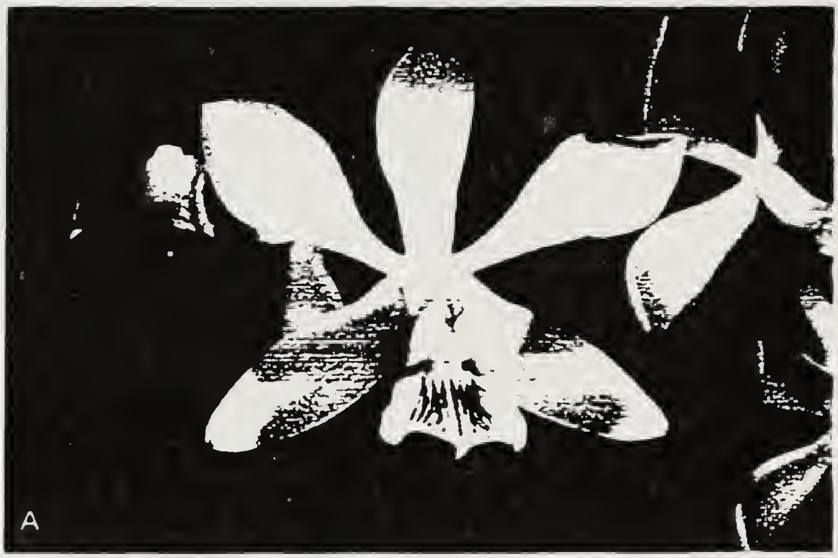

Figure 2-28. Lip Configuation: A. not tubular in *Encyclia steinbachii*; B. tubular in *Cattleyopsis lindenii*.

Figure 2-29. Lip Attachment: A. hinged in *Bulbophyllum putidum*; B. unhinged in *Encyclia cyanocolumna* .

Figure 2-30. Lip Transition: A. abrupt in *Brassavola cucullata*; B. gradual in *Hexisea imbricata*.

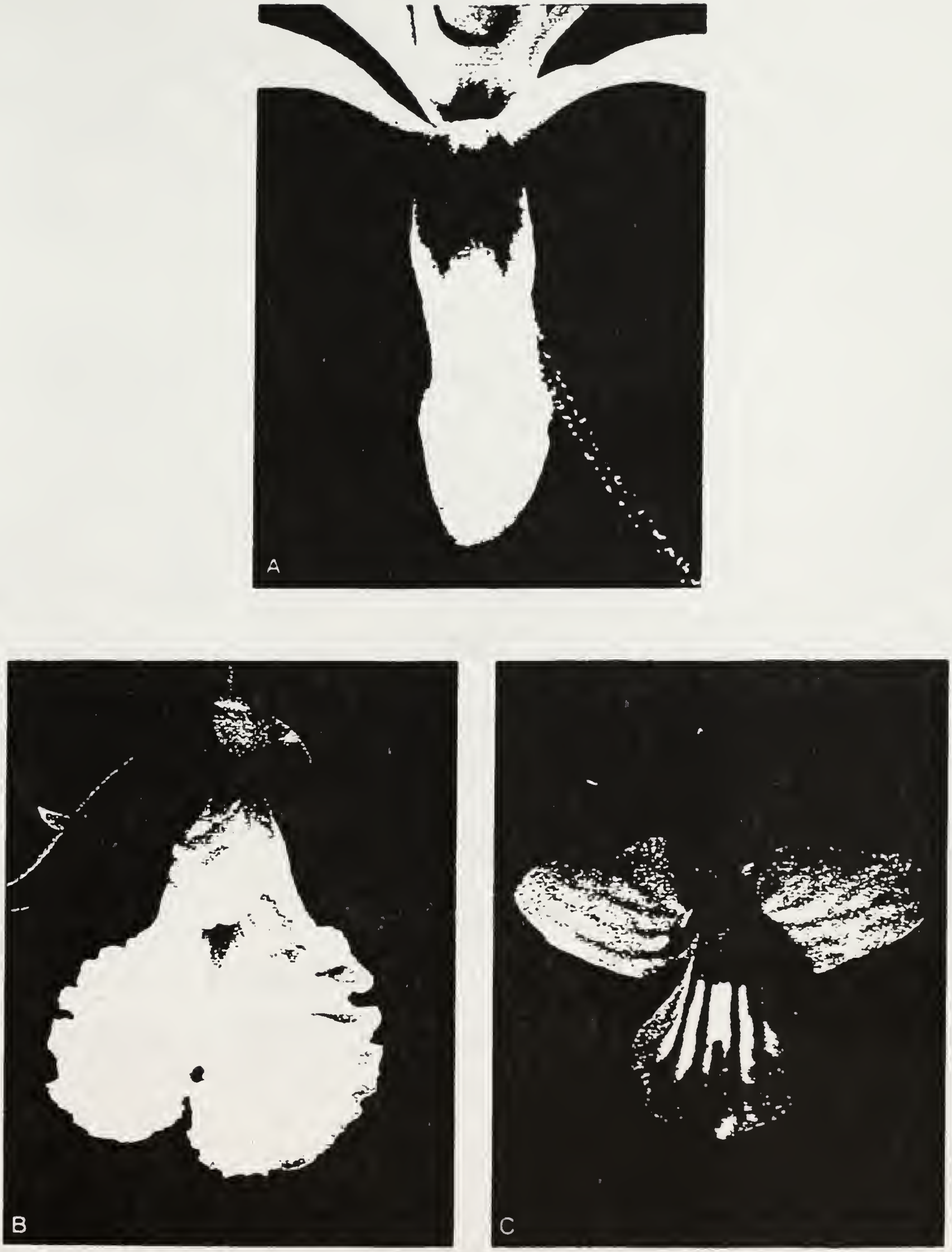

Figure 2-31. Lip Lobes: A. one in *Nidema boothii*; B. two in *Euchile mariae*; C. three in *Tetramicra elegans*.

Figure 2-32. Side-lobe adnation: A. fused in *Psychilis mcconnelliae*; B. free in *Prosthechea concolor*.

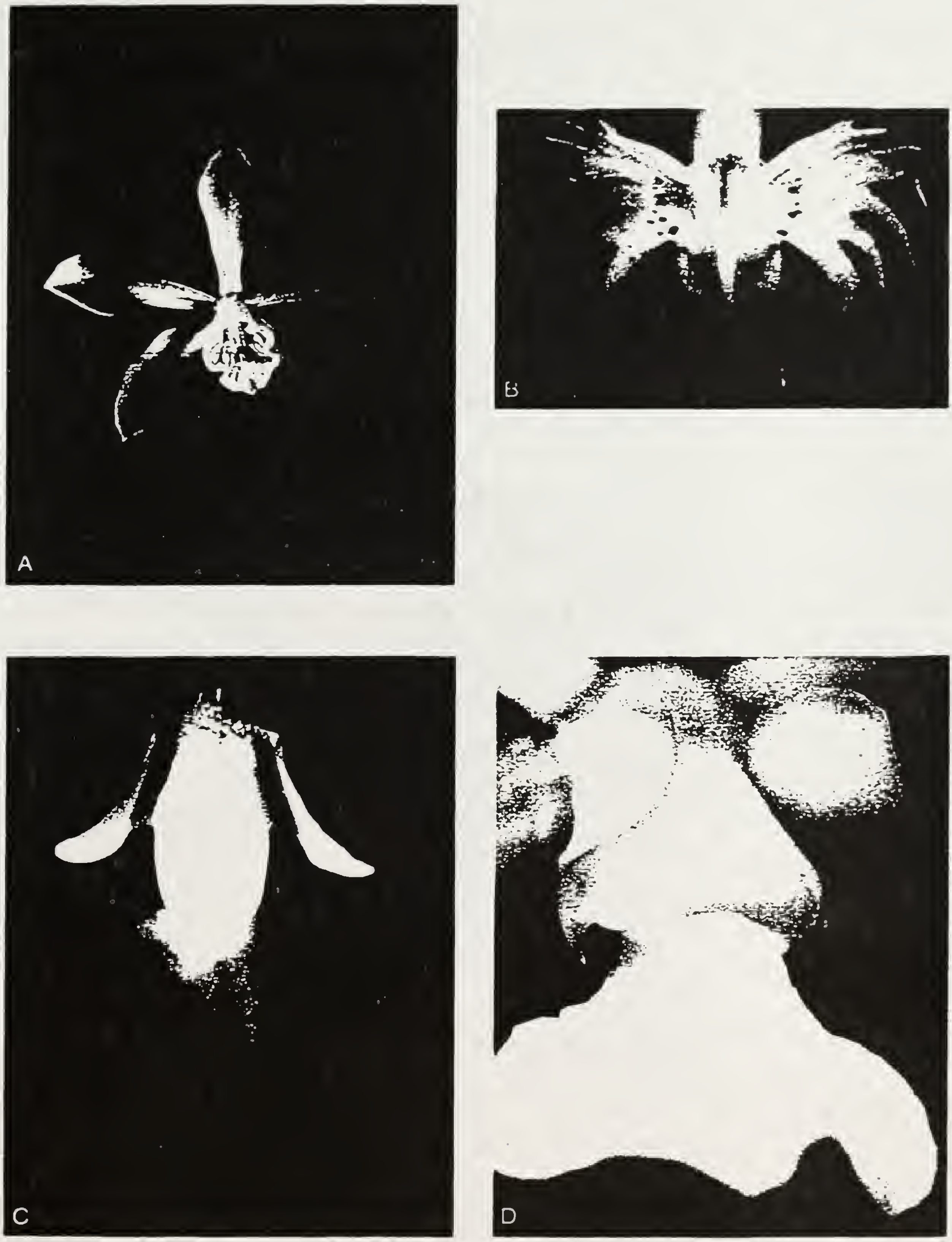

Figure 2-33. Sidelobe Posture: A. encircle in *Encyclia candollei*; B. flat in *Epidendrum ibaguense*; C. upturned in *Encyclia bracteata*; D. clasping in *Encyclia asperula*.

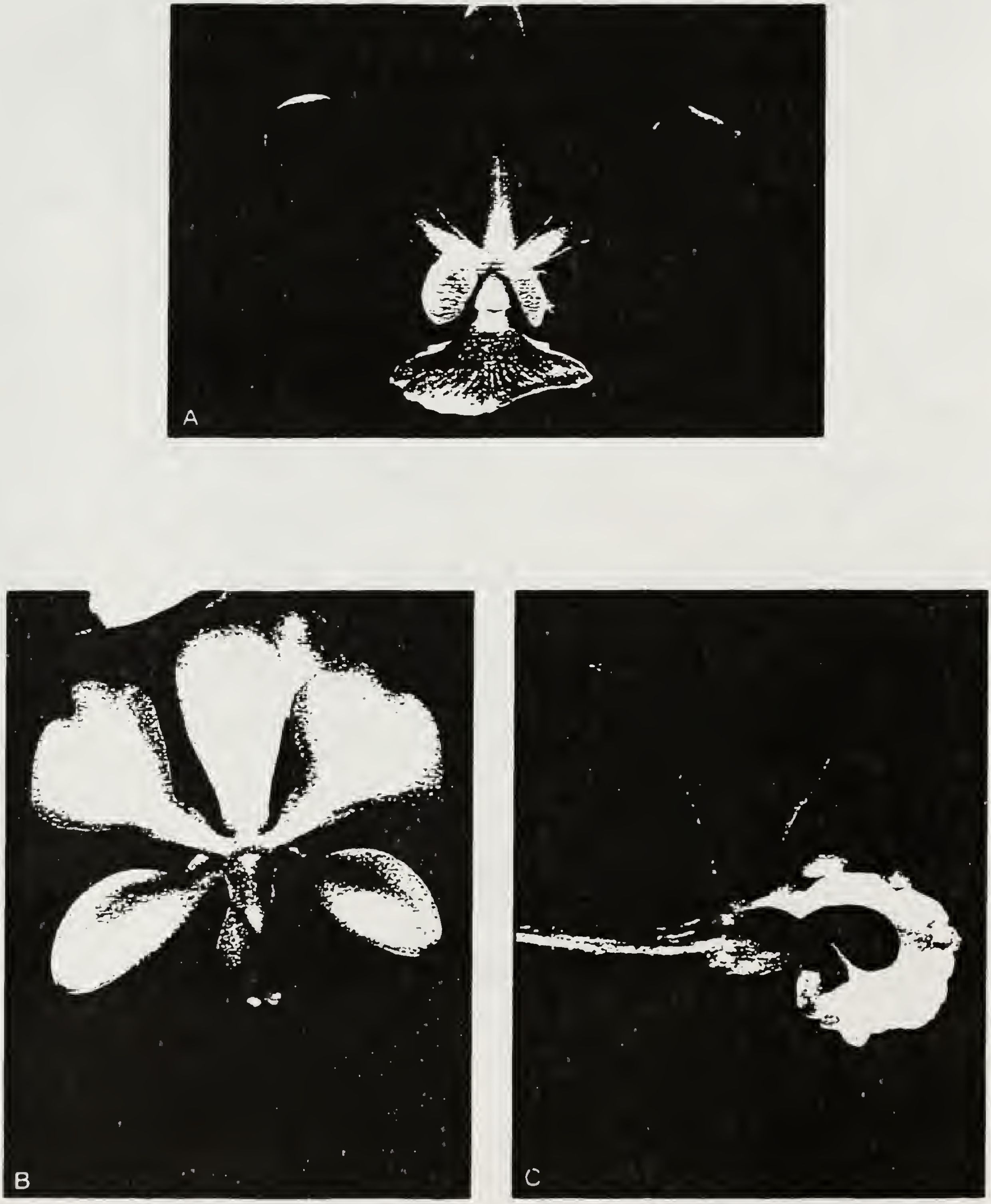

Figure 2-34. Lip Plane: A. flat in *Encyclia randii*; B. recurved in *Encyclia dichroma*; C. reflexed in *Epidendrum subulatifolium*.

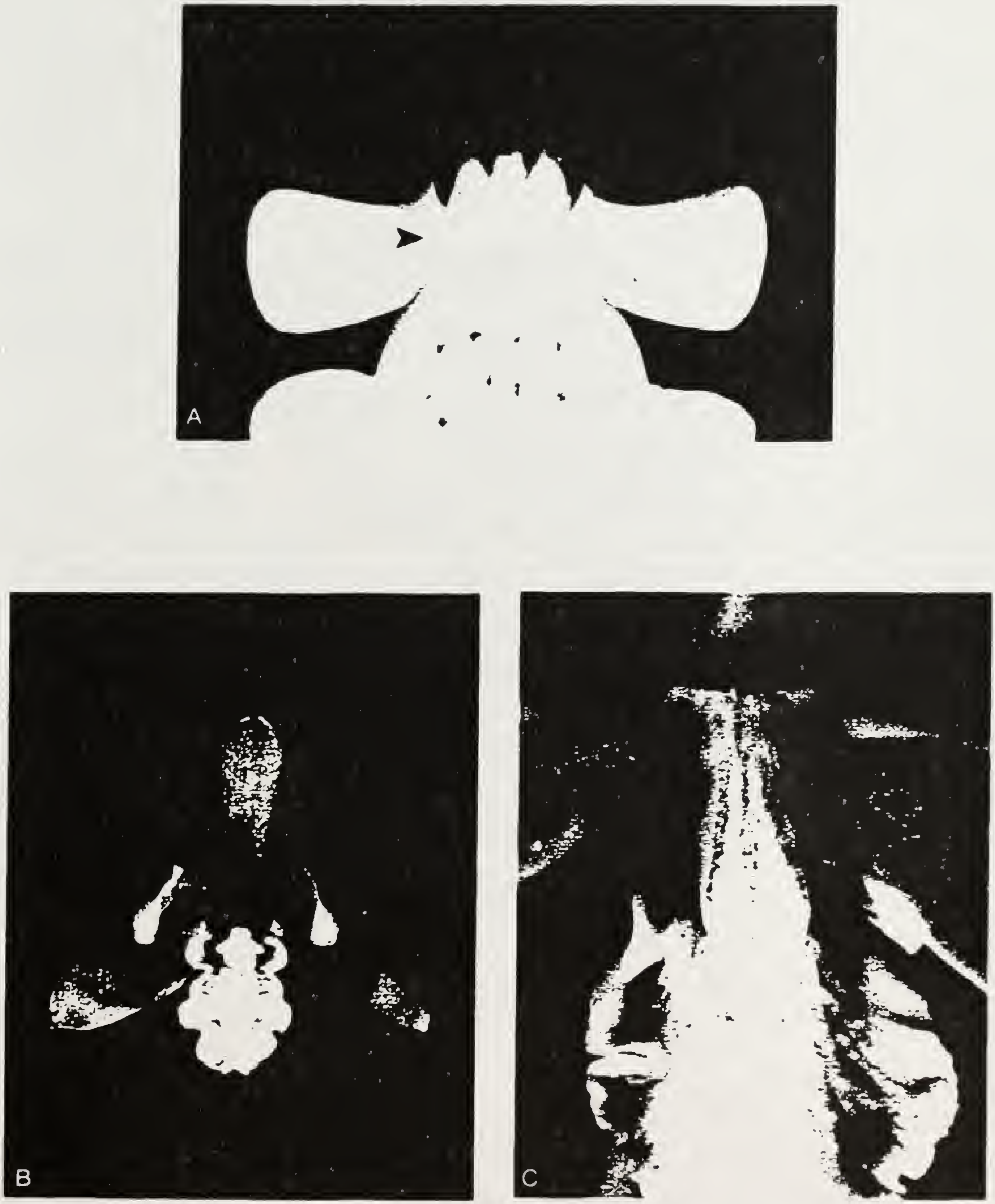

Figure 2-35. Callus Shape: A. platform in *Prosthechea concolor*, B. papillate in *Prosthechea livida*; C. ridged in *Encyclia tarumana*.

Figure 2-36. Rostellum: verticle in *Psychilis mcconnelliae.*

Figure 2-37. Column Foot: present in *Ponera striata.*

Figure 2-38. Column Posture: curved in *Nidema boothii.*

Figure 2-39. Column Wings: A. absent in *Psychilis mcconnelliae*; B. present in *Encyclia thienii*.

Figure 2-40. Mid-tooth Appendage: A. absent in *Encyclia asperula*; B. present in *Prosthechea cochleata*.

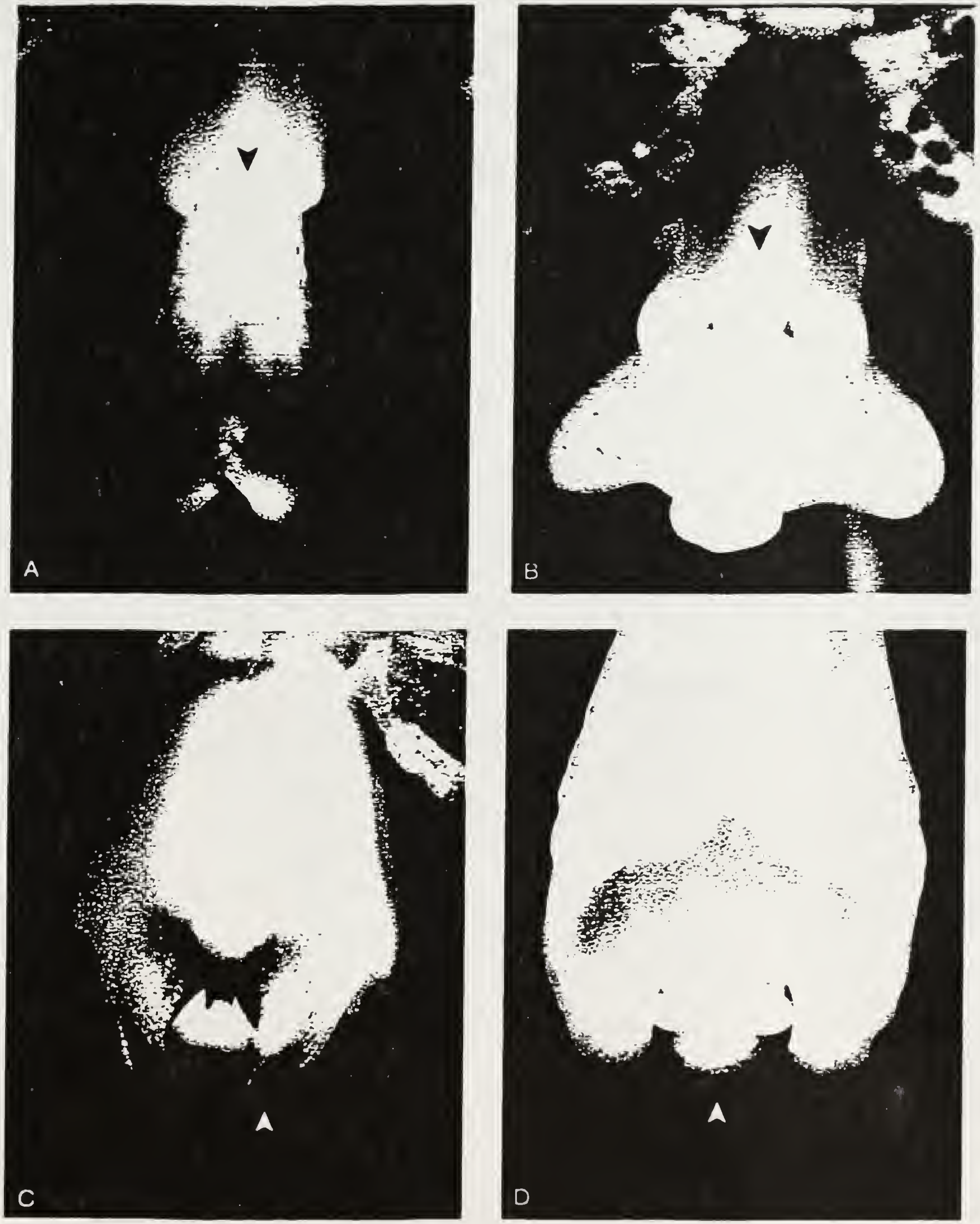

Figure 2-41. Midtooth Shape: A. deltoid in *Encyclia cyperifolia*; B. obtuse in *Prosthechea magnispatha*; C. fimbriate in *Brassavola cucullata*; D. truncate in *Euchile mariae*.

Figure 2-42. Midtooth Size: A. large in *Prosthechea glauca*; B. small in *Encyclia diurna*.

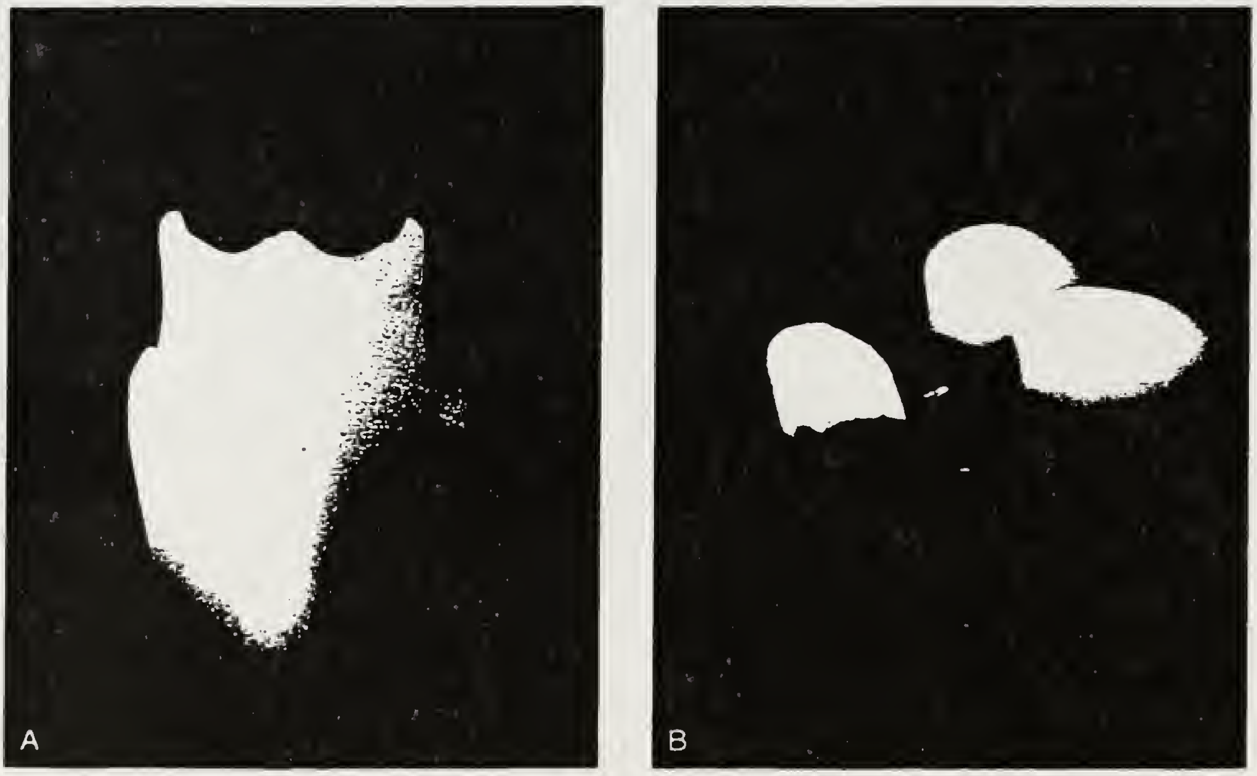

Figure 2-43. Column Teeth Length: A. short in *Encyclia bracteata*; B. long in *Prosthechea tripunctata*.

Figure 2-44. Lateral Teeth Shape: A. wing-like in *Encyclia distantiflora*; B. deltoid in *Encyclia tarumana*; lanceolate in *Dinema polybulbon*; D. obtuse in *Prosthechea vitellina*.

Figure 2-45. Anthercap Appression: appressed in *Encyclia tarumana*.

Figure 2-46. Anthercap Length: protruding in *Encyclia* randii.

Figure 2-47. Anthercap Position: top in *Meiracyllium trinasutum*.

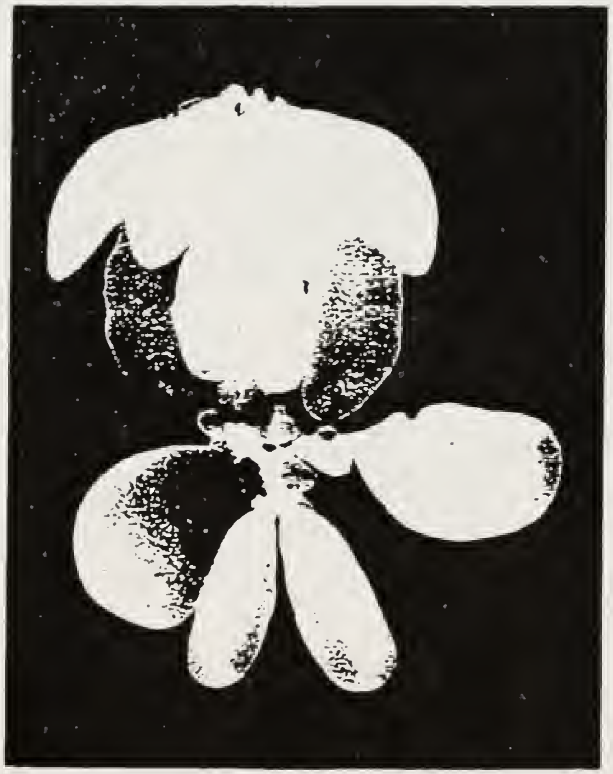

Figure 2-48. Pollinia Shape: flattened in *Brassavola cucullata*.

Figure 2-49. Viscidium: present in *Epidendrum conopseum*.

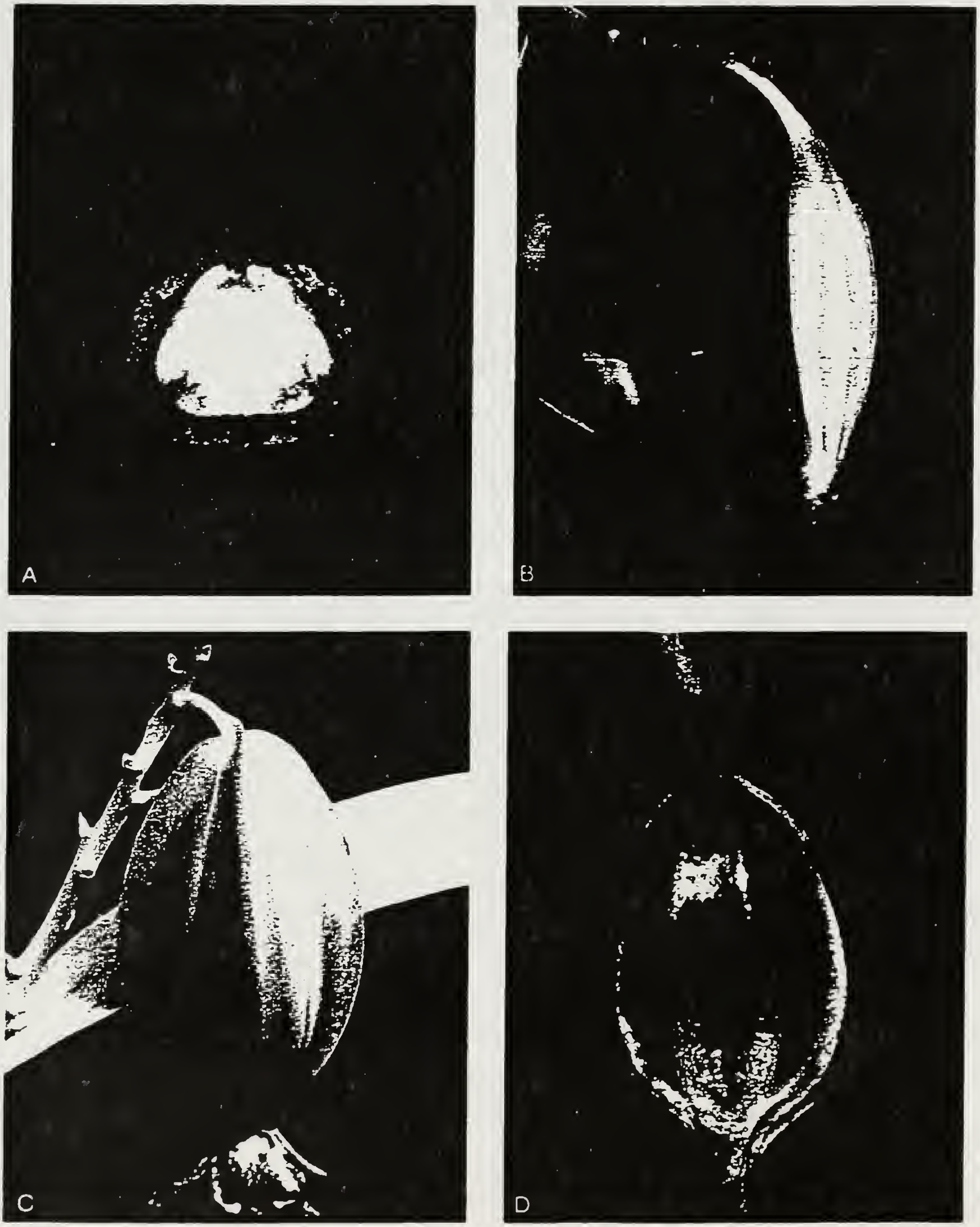

Figure 2-50. Capsule Shape: A. winged in *Prosthechea cochleata*; B. fusiform in *Dinema polybulbon*; C. 3-angled in *Prosthechea radiata*; D. ellipsoid in *Cattleyopsis lindenii*.

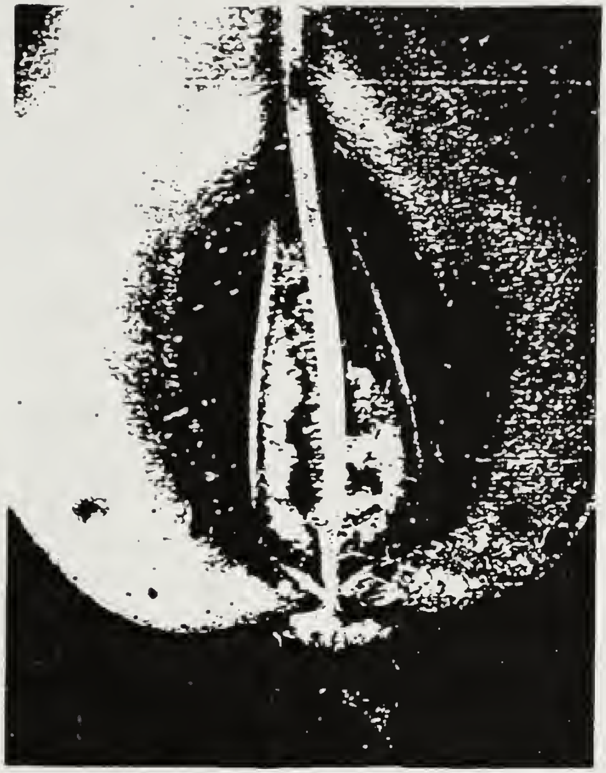

Figure 2-51. Capsule Suture: present in *Prosthechea livida*.

Figure 2-52. Ovary Apex: beaked in *Brassavola cucullata*.

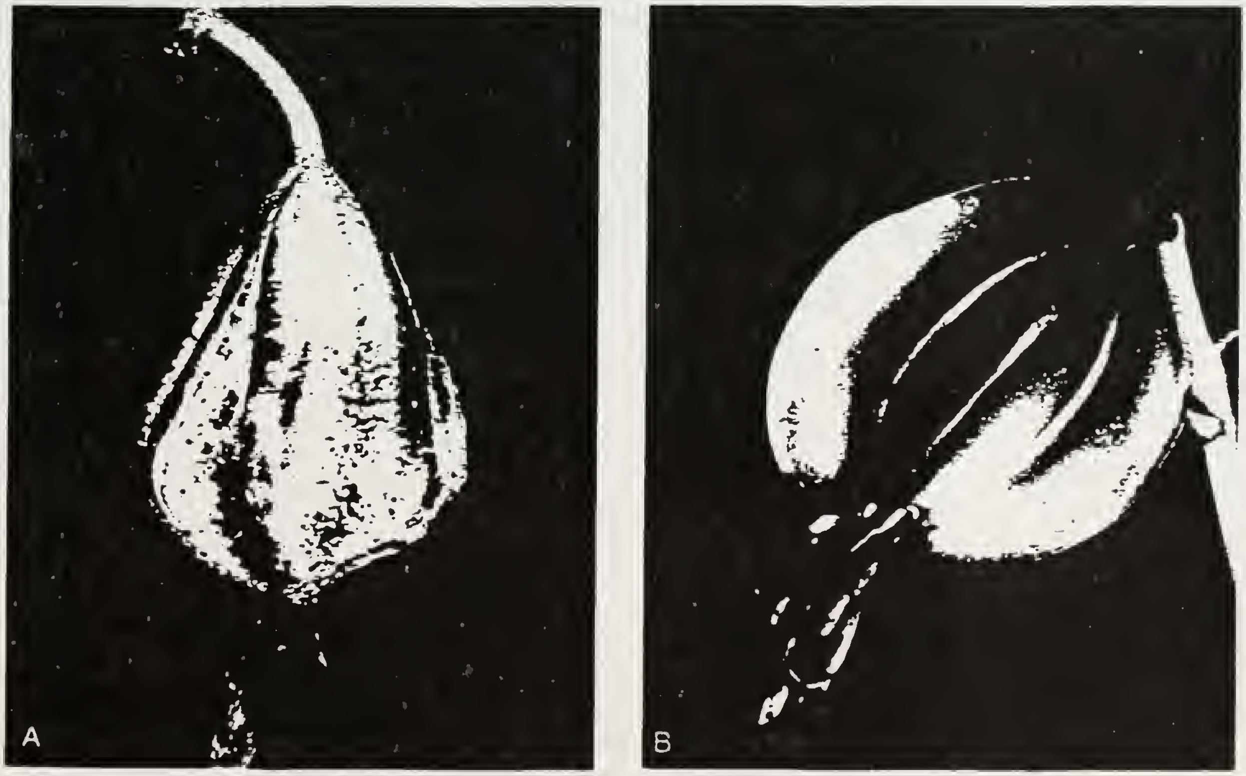

Figure 2-53. Capsule Surface: A. warty in *Encyclia adenocaula*; B. smooth in *Prosthechea chondylobulbon*.

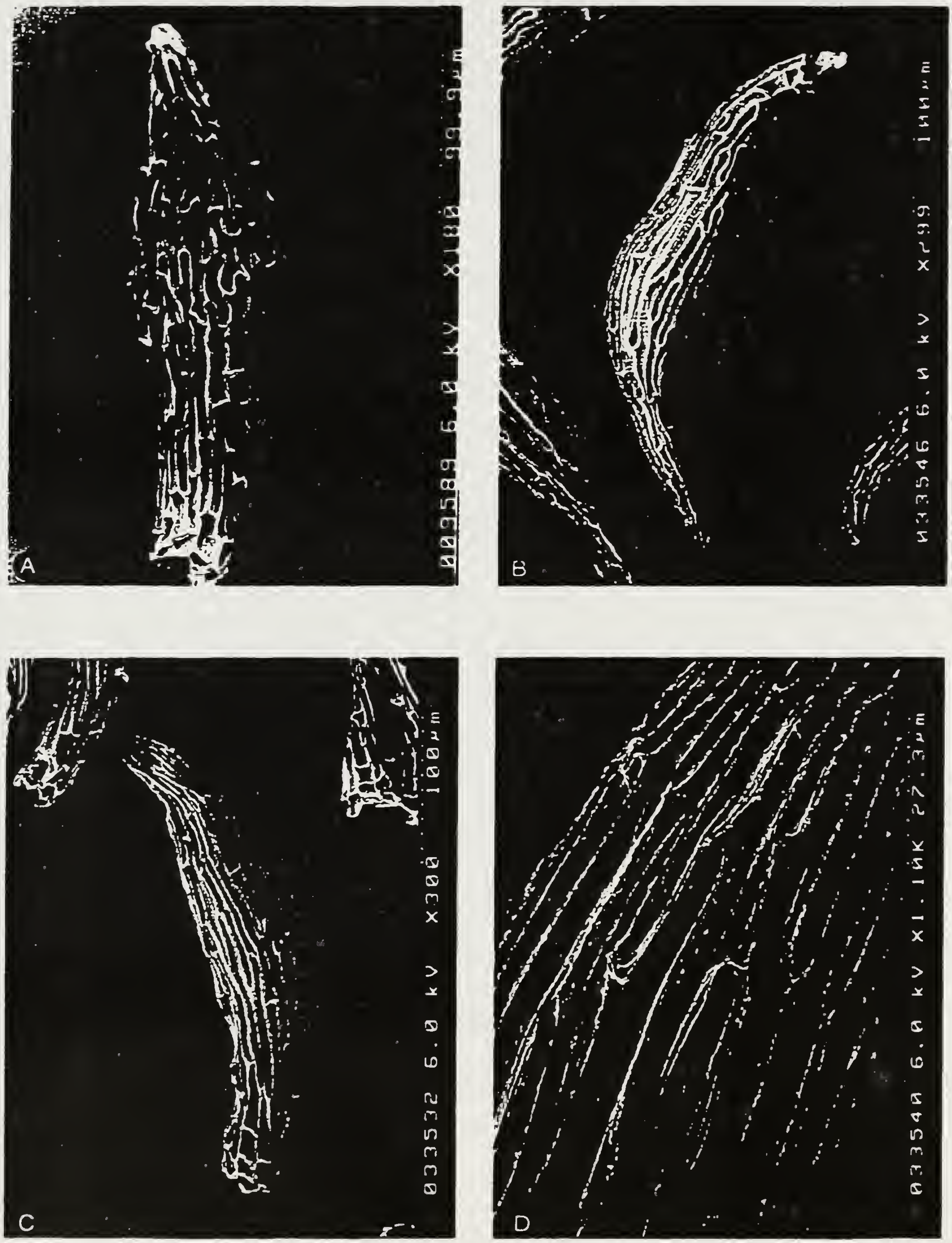

Figure 2-54. Seed Type: *Epidendrum* type in A. *Prosthechea cochleata*; B. *Prosthechea chimborazoensis*; C. *Encyclia dichroma*; D. *Encyclia phoenicia*.

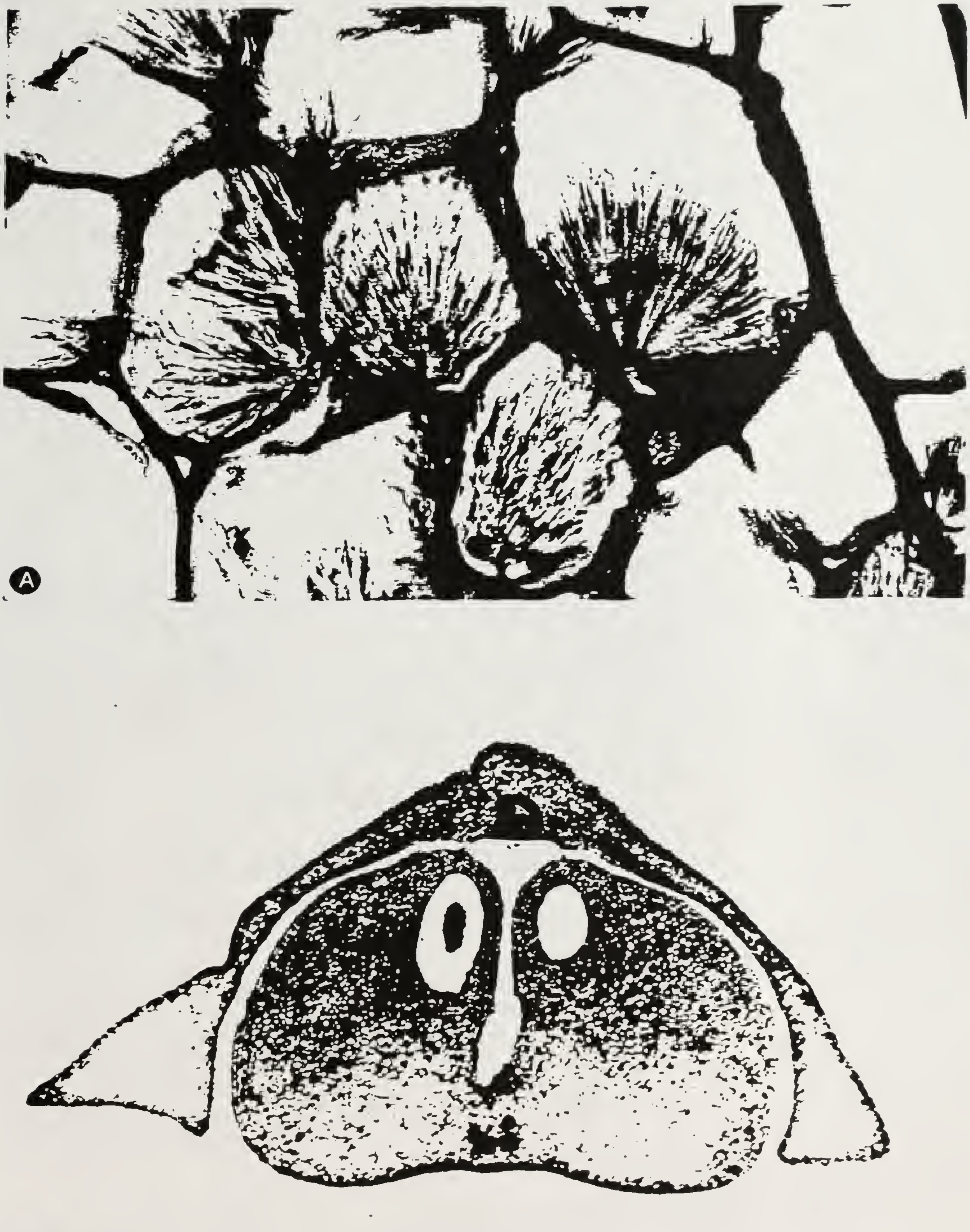

Figure 2-55. Druse-type Crystals: A. present in *Prosthechea cochleata*; B. absent in *Encyclia tampensis*.

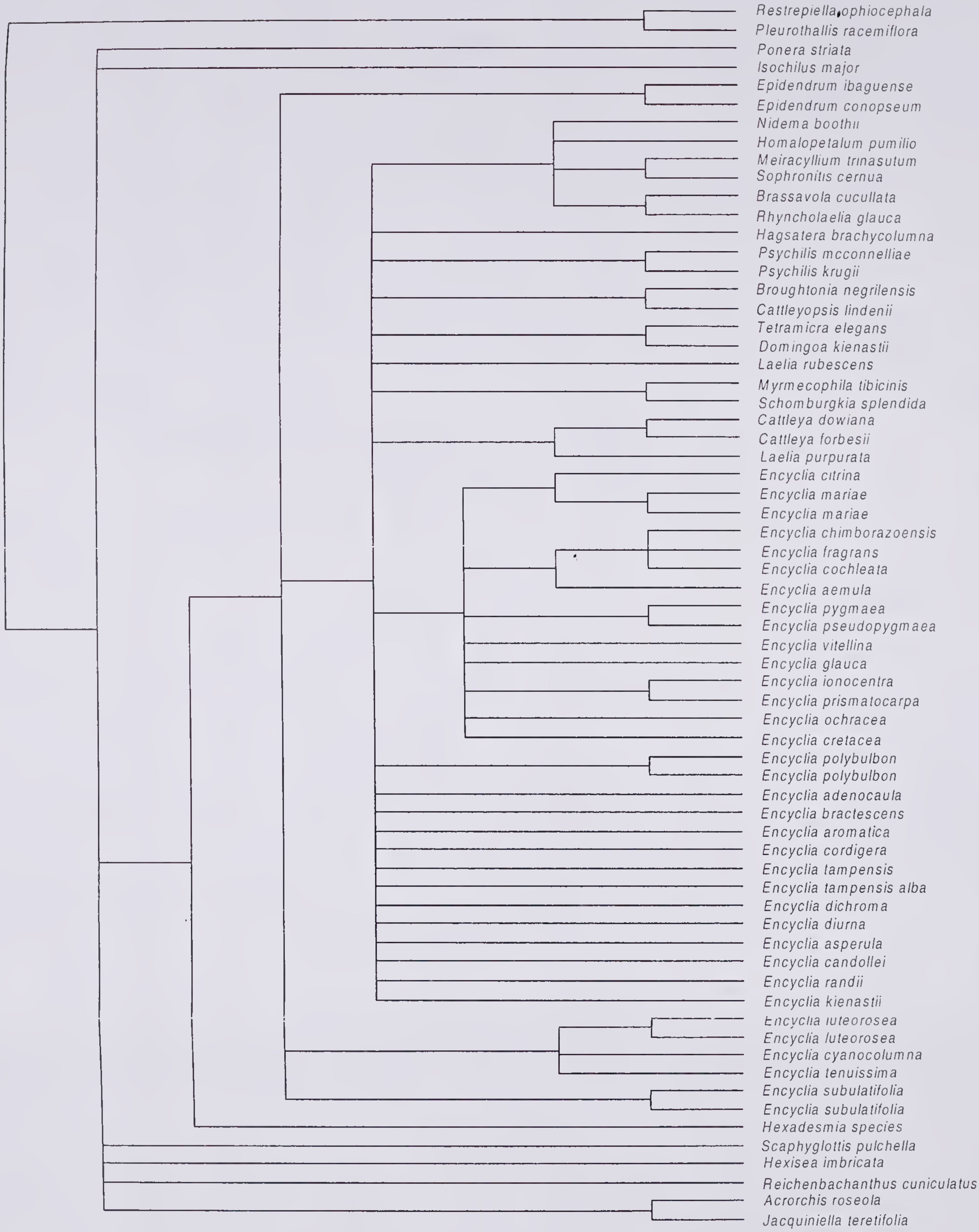

Figure 2-56. Equally weighted morphological strict consensus tree for 32700 equally parsimonious trees with a length of 631 steps. The parsimony tree scores were: CI = 0.225, RI = 0.619, and RC = 0.139.

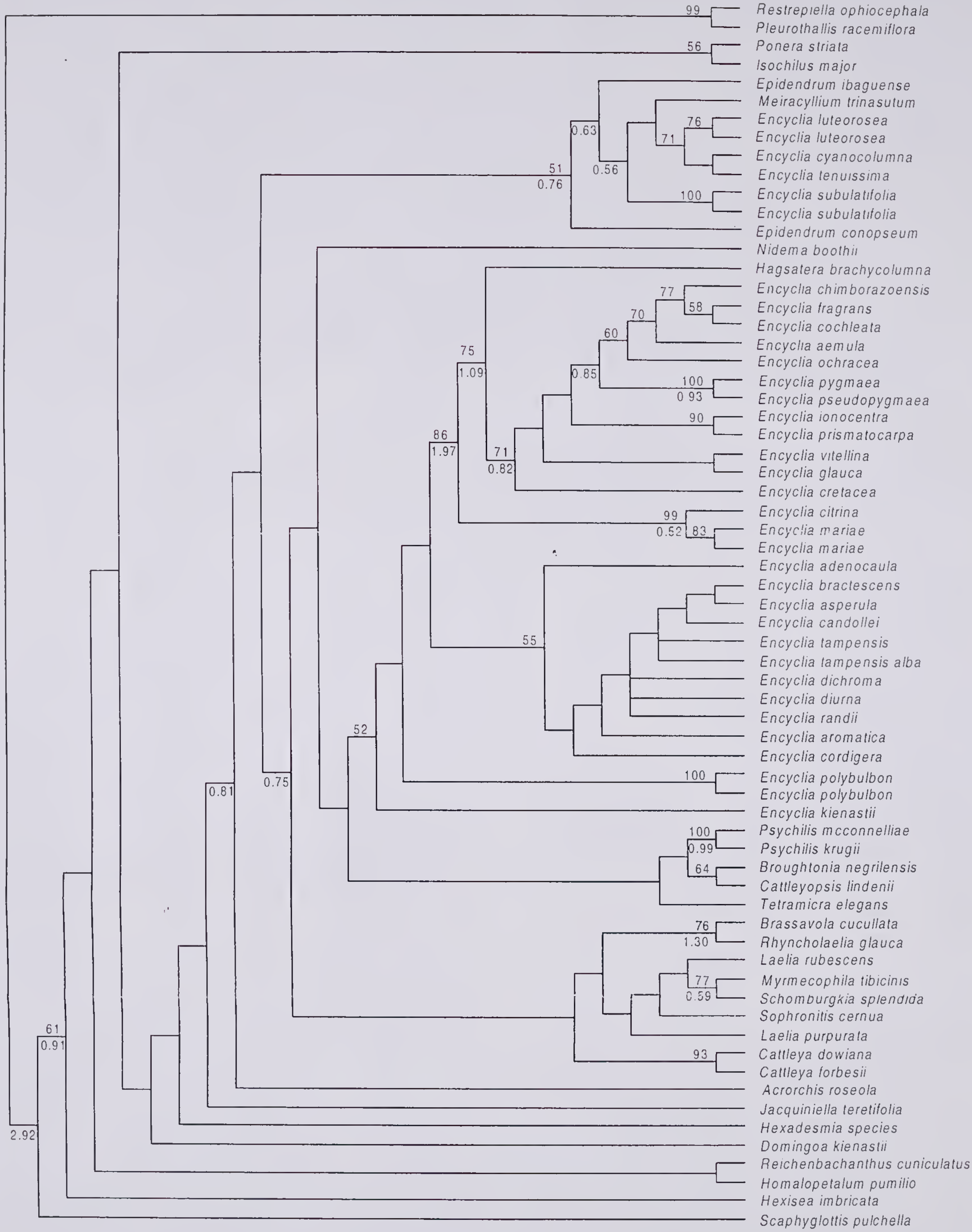

Figure 2-57. Weighted morphological strict consensus tree for 20 equally parsimonious trees. The tree scores were: Length (L) = 665 steps, CI = 0.214, RI = 0.592, and RC = 0.126. Bootstrap percentages greater than 50 percent are given above the line. Decay indices greater than 0.5 steps are indicated below the line.

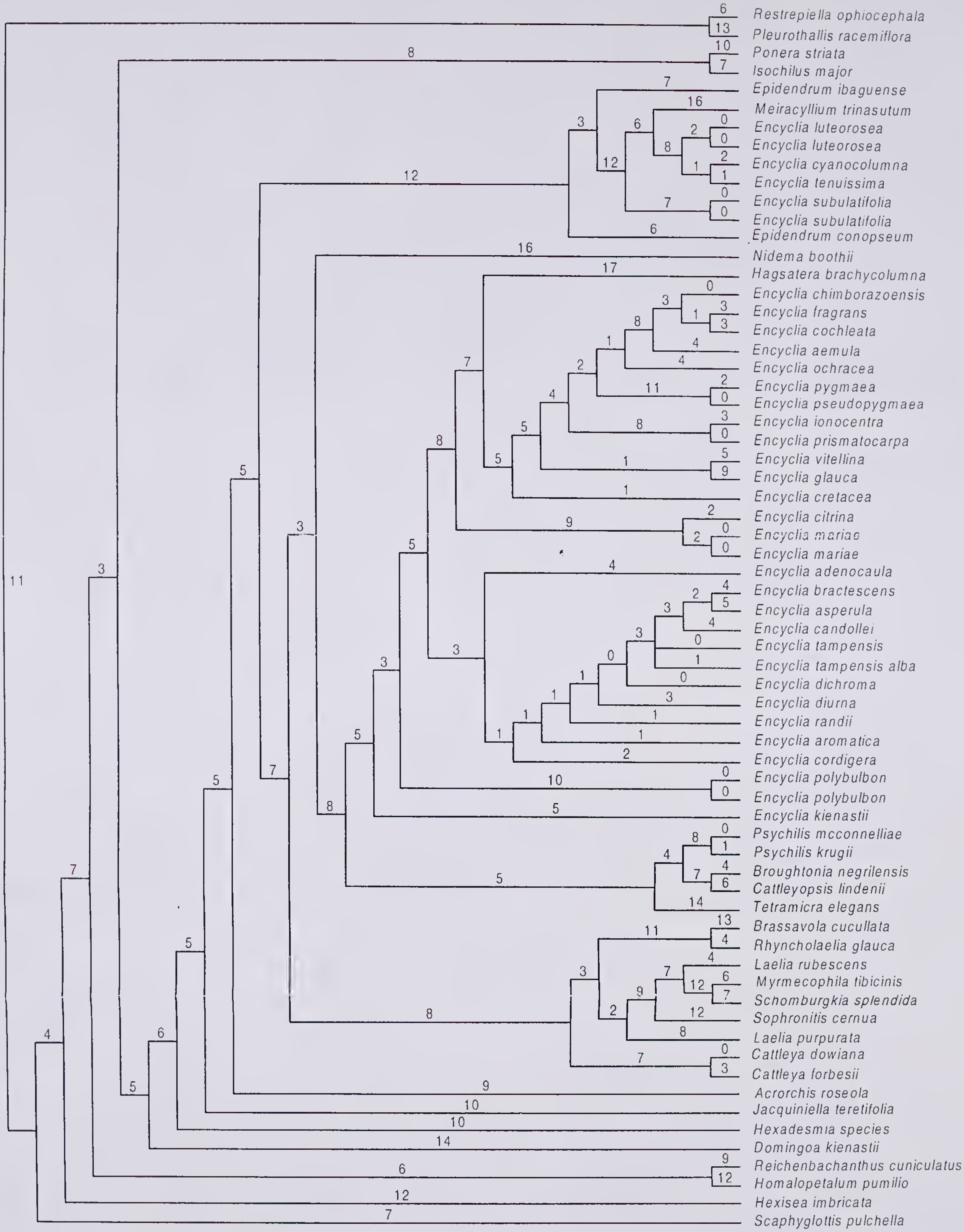

Figure 2-58. Randomly selected tree for weighted morphology. The branch lengths are indicated in number of steps. Note: The morphological characters are mapped onto the tree resulting from the holomorphology analysis in Chapter 4.

CHAPTER 3
MOLECULAR STUDIES

Introduction

Genomic DNA provides an invaluable source of information for use in estimating the phylogeny of all organisms. A molecular study consists of six phases: gene selection, DNA acquisition, DNA amplification, DNA sequencing, data processing, and data analysis. The gene selection phase starts with an online search of GenBank for sequences from your taxonomic group and related taxa (Benson, et al., 1999). The data from a few sequences for study taxa or their relatives can help detect presence of useful variation. Different regions of the nuclear, chloroplast, or mitochondrial genomes can be sequenced depending on the taxonomic level under study. A significant difference among the genomes is that the nuclear genome arises from biparental inheritance, whereas chloroplast and mitochondrial genomes are typically inherited from only one parent. Different gene regions have different levels of mutation (variation). The appropriate region must be chosen for the taxonomic level of the study. There are a number of regions that have been sequenced and the usefulness for answering specific taxonomic questions is shown in Figure 3-1 (Soltis, et al., 1998). A search of GenBank can also provide the names of other systematists working on related taxa (or genes). Other researchers can be an important resource for primer selection or design and research protocols.

Research in Orchidaceae

Molecular plant systematic data can be analyzed with methods similar to traditional morphology-based cladistics. Nucleotide changes in DNA sequences are used as characters. Indels (insertions or deletions) in DNA sequences can also be coded as characters in sequences that are relatively conserved. DNA sequences can provide large number of characters that prove to be informative in parsimony analyses. Molecular characters are not ordered or *a priori* polarized although polarization occurs when tree is rooted with an outgroup. As with morphological characters, molecular characters are subject to homoplasy because there are only four possible bases (A,T,C,G).

The use of DNA sequencing for taxonomic studies is relatively new for Orchidaceae. Current techniques with appropriate selection of DNA for the taxonomic level being studied have proven successful (Soltis, et al., 1997). For example, ITS sequences have been extremely valuable in evaluating monophyly at generic level and below in Cypripedioideae (Cox, et al., 1997) and at the subtribal level and below in Catasetinae (Pridgeon and Chase, 1998), Oncidiinae (Williams and Chase, unpubl.), Stanhopeinae (Whitten, et al., 2000), Disinae (Douzery, et al., 1999), Gastrodieae and Neottieae (Kores & Molvray, unpubl.), Pleurothallidinae (Pridgeon and Chase, unpubl.), and Orchidinae (Pridgeon, et al., 1997).

Nuclear Genome

Sequencing ITS regions has provided a good source of nuclear DNA characters for inferring intrageneric and intergeneric evolutionary relationships in many plant groups (Baldwin, et al., 1995), and preliminary studies suggest it will also be useful in

Orchidaceae. The study of intrageneric relationships requires DNA sequences of adequate size and fast evolutionary rate (nucleotide variation) (Nickrent, et al., 1994). The ITS regions of rDNA have been shown to evolve at rates appropriate for examining diverging lineages (Baldwin, 1992). The ubiquity of rDNA and available techniques for rapid determination of the nucleotide sequence make rDNA a good tool for inferring evolutionary relationships, except in cases of hybridization (Hamby and Zimmer, 1992). In hybrids, the nuclear genome is a recombination of DNA from both parents. Thus, hybrid ITS sequences can be very polymorphic. The nuclear genes that code for ribosomal DNA are arranged in a tandemly repeated unit that is found in high and variable copy number (Rogers and Bendich., 1987). The functioning regions are highly conserved due to selective pressures while the spacer regions that do not code for a functional RNA are not subject to the same selective pressures. The spacer regions are not highly conserved and contain species-specific variation (Hamby and Zimmer, 1992). In these internal transcribed spacer (ITS 1 & 2) regions, the number of substitutions is typically twice as large between genera as within genera (Savard, et al., 1993). Thus, ITS regions are valuable for taxonomic studies at lower subgeneric levels in some taxa.

Plastid Genome

Plastid DNA is a relatively abundant component of total plant DNA with a conservative rate of nucleotide substitution (Palmer, et al., 1988). The chloroplast genomes of photosynthetic land plants are circular DNA molecules ranging from 120 to 217 kilobase pairs. The genome contains two large inverted repeats that separate the large and small copy regions (Palmer, 1986). Expansions or contractions of the inverted repeat regions are largely responsible for variations in the molecular size of the genome.

Both strands of the chloroplast genome are actively expressed. Recombination does not play a major role in cpDNA evolution, where biparental transmission is rare, and intraspecific diversity is low. Chloroplast DNA provides uniparental (usually maternal) phylogenetic markers (Soltis, et al., 1992). The types of mutations that are found in DNA include: nucleotide rearrangements, point mutation substitutions, insertions, and deletions. Studies of combined plastid DNA have been useful in cladistic analyses of Amaryllidaceae, another petaloid monocotyledon (Meerow, et al., 1999). The *trnL-F* region and *matK* gene were chosen for this study because they have appropriate levels of variation (mutation).

trnL-F region

The DNA that encodes for the transfer RNA for leucine is designated as *trnL*. The region of the chloroplast genome spanning the area from the *trnL* 5' exon to the *trnF* 5' exon is defined as the *trnL-F* (UAA) intron sequence (Taberlet, et al., 1991). This non-coding region displays one of the highest frequency of mutation in the chloroplast genome (Palmer, et al., 1988). Additionally, length mutations, indels (insertions/deletions) provide parsimony-informative characters (McDade and Moody, 1999). The *trnL-F* sequences have proven useful in the phylogenetic analysis at the generic level (Gielly, et al., 1996). Researchers at the Jodrell Laboratory, RBG Kew have found the *trnL-F* region to be useful in the resolution of intrageneric relationships (Molvray, et al., 1999). This region provided an intermediate level of resolution within Laeliinae.

matK gene

The *matK* gene encodes an RNA maturase involved in splicing introns from transcripts. This region is located between the 5' and 3' exons of the transfer RNA gene for Lysine. The *matK* gene has proven useful in resolving relationships in Saxifragaceae (Johnson and Soltis, 1995) and Ericaceae (Kron and Judd, 1997; Kron, et al., 1999). Indels in *matK* sequence data provide additional support for clades in *Saxifraga* (Soltis, et al., 1996). This region provided limited deeper resolution within the Laeliinae phylogeny.

Materials and Methods

Many methods for plant DNA extraction and amplification have been published (Soltis, et al., 1998). Any method should be considered a starting point since nearly all the protocols must be optimized for the organisms under study. There are also a number of computer programs available for processing and analyzing molecular data (Platnick, 1988). The selection of these programs is often the personal preference of the researcher. In the present study, fresh plant tissue was used when available and field collected specimens were preserved in silica gel (Chase and Hills, 1991). Recipes for all required solutions are found in Appendix C.

DNA Extraction

The process of DNA extraction requires the following phases: breaking cell walls, rupturing membranes, separating water soluble components, precipitating DNA, removing salts, and resuspending purified DNA in a buffer. The DNA extraction used

was a modification of a typical Cetyl TrimethylAmmonium Bromide (CTAB) method (Doyle and Doyle, 1987). Fresh plant tissue (0.2 g) was ground in a mortar with 1000 µl of CTAB (2X) buffer and 8 µl of mercaptoethanol, until completely homogenized. Mercaptoethanol inhibits enzymes that cause browning which can degrade DNA. The homogenate (800 µl) was placed in a 1.5 ml eppendorf tube and heated at 65°C (Fisher Scientific Dry Bath Incubator, 11-718) for 30 minutes. The CTAB is a detergent that lyses nuclear and organelle membranes releasing the DNA. Next 500 µl of SEVAG (chloroform/isoamyl alcohol 24:1) was added and the solution vortexed (Vortex-Genie, 12-812) until a milky suspension was obtained. The chloroform is used to remove chlorophyll and other lipids from the mixture. The suspension was centrifuged at 8,000 rpm for 10 minutes to separate the phases. The green chloroform layer remained on the bottom, plant debris in the middle, and the aqueous layer containing the DNA was on top. (The chloroform extraction can be repeated if the aqueous layer is still green.) The aqueous phase was transferred into a clean 1.5 ml tube and the total volume was recorded. Sodium acetate (3M, pH 4.8) was added to the aqueous phase to a final concentration of 1.0 M (0.04 x total volume). Then 100% isopropanol (0.65 x new total volume) was added and placed at –20°C overnight (several hours) to precipitate DNA. The DNA was pelleted at 10,000 rpm for 20 minutes. The DNA was decanted and 1000 µl of 70% ethanol was added to wash impurities (salts) from the pellet (and tube), this step was repeated once. The open tube was placed in a vacuum centrifuge (CentroVap Concentrator, Labconco 78100) heated to 65°C for 10 minutes or until the pellet was dry. The DNA was redissolved in 75 µl of TE (1X) by incubating at 65°C for 15 minutes (to assure resuspension of the DNA; finger-flick to mix). The total DNA was stored at -20°C.

DNA quality was verified by electrophoresis in a 1% agarose gel containing Ethidium Bromide (EtBr) in a Tris-Borate EDTA Buffer (TBE). The ethidium bromide

intercalates with the DNA making it fluorescent under UV light. The DNA was prepared for viewing by mixing 2 µl of total DNA with 4 µl of loading dye on a sheet of Parafilm producing a blue droplet. This droplet was added to a well in the agarose gel and run at 94 volts for 10 minutes. The DNA was viewed on an UV illuminator (VWR Scientific M-20E) and photographed with a Polaroid camera (FB-PDC-34), with hood (FB-PDH-1314), using Polapan 667 film. The total DNA sample should have a band of high molecular weight DNA with a smear of smaller fragments (Figure 3-3).

DNA Amplification

Polymerase chain reaction (PCR) was used to amplify DNA from a specific region or gene. The desired region was selected using a pair of forward and reverse primers that flank the region to be amplified. Since the total DNA extract is a mixture of nuclear, plastid, and mitochondrial DNA, a selected portion can be amplified from any of the genomes. The primers are short complementary pieces of DNA that are used to initiate replication. The purpose is to obtain enough DNA of that specific gene so it can be sequenced.

The process requires a mixture of template (total DNA extract), buffer, dNTPs (nucleotides), magnesium chloride, primers (forward and reverse), PCR enhancer, and Taq polymerase. This mixture is heated to separate the DNA template strands, then cooled to allow the primers to anneal to the template, and warmed to allow the polymerase to replicate the specific area of the template. This cycle is then repeated. The amplification of the DNA is roughly geometric (doubles each cycle) so that there are millions of identical copies produced after 30-35 cycles. The PCR product is then cleaned to remove excess reagents, primers, and enzyme. This purified product serves

as the template for sequencing. A Biometra UNO thermal cycler was used for all the PCR and cycle sequencing protocols.

The pH of the mix affects the amount of magnesium chloride available, thus affecting the specificity of binding of the primers to the template. Betaine (N,N,N-trimethylglycine), a naturally occurring cryoprotectant in plants, can be used to increase the efficiency of amplification (a PCR enhancer). Betaine acts as an isostabilizing agent by relaxing the secondary structure of the template equalizing the contribution of CG and AT base pairing to the stability of the DNA duplex (Frackman, et al., 1998). The optimal amounts of these two ingredients can vary among taxa DNA. Thus, optimization (trial and error) is required for a particular template. The time required to setup a PCR is reduced by preparing a 2X premix. This premix can be made in large batches and stored in the refrigerator for weeks. The mix is made in multiples of the amounts listed in Table 3-1.

Table 3-1. 2X PCR Premix.

Component	Amount
10x PCR buffer	5 µl
$MgCl_2$, 25 mM	6 µl
dNTPs 20 mM	1 µl
Betaine, 5 M	13 µl
Total	25 µl

This premix is then used to prepare the Master mix for PCR reactions. The master mix contains the premix, molecular grade water, and the forward and reverse primers for a specific region. Typically, a master mix (Table 3-2) will be made for extra reactions to account for pipetting error.

Table 3-2. Master Mix per tube.

Component	Amount
Premix	25 µl
Water	22 µl
Forward primer*	1 µl
Reverse primer*	1 µl

*10 pmol/µl

The initial setup for each amplification is the same regardless of gene region. One 0.2 ml thin walled PCR tube was labeled for each sample and arranged in the thermocycler block. Forty-nine microliters of master mix was aliquoted into each PCR tube. Then 1 µl of total DNA template was added to each labeled tube. The thermal-cycler program for the gene was started, and when the block temperature reached 94 C°, 0.25 µl of *Taq* polymerase was added to each tube. The program takes almost three hours to run.

The quality and quantity of the PCR products was verified and evaluated using electrophoresis in a 1% agarose gel using the same protocol as for total DNA. The PCR product should be one distinct band of DNA (Figure 3-3). If the product has multiple bands or a smear of fragments it is unusable without additional time consuming steps and PCR trouble shooting is required.

Trouble shooting PCR failures involve adjustments to the thermal-cycler protocol and changes to the master mix. The optimum annealing temperature depends upon the length and composition of the primers used and how well the primer sequences match the DNA sequence. There are formulae for calculating (estimating) optimum annealing temperature, but often it must be determined by trial and error. A high annealing temperature will produce no amplification because the primers cannot bind to the template. Too low an annealing temperature will cause non-specific amplification because the primers bind to many different sites. The concentration of $MgCl_2$ is also quite critical, and must be determined for a particular primer pair. The magnesium concentration affects the binding of primers to the template. Higher concentrations of $MgCl_2$ result in less specific binding. The optimal final concentration values typically range from 1.5 to 4.0 mM (Whitten, 1998).

The PCR products should be frozen (-20° C) as soon as possible. Storing them at room temperature (or at 4° C) will allow degradation. The Taq polymerase has a 5'-3' exonuclease activity that will slowly nibble away the end of the PCR products and eliminate the primer binding sites. This will make it difficult to sequence the product using the same primers (amplimers) used for amplification (Doyle, 1996).

ITS region

Amplification of the ITS region uses two variations to standard PCR protocols, the "hot start" and the "touchdown". In a hot start PCR, the Taq polymerase is not added until the tubes have been heated to 94° C. Hot starts prevent mispriming and yield cleaner amplifications. Touchdown PCR uses a modified thermal-cycler program that gradually lowers the annealing temperature. The initial annealing temperature is higher than the predicted annealing temperature. The temperature is lowered one degree during subsequent cycles until the optimum annealing temperature is reached. The remaining cycles are performed at the lower annealing temperature. This touchdown to the optimal annealing temperature insures that the first DNA strands copied are those with perfect or near-perfect matches to the primers. By the time the lower annealing temperature is reached, the reaction is preloaded with many copies of the desired DNA. These specific products out number any misprimed products that occur at lower temperatures, resulting in cleaner, more specific PCR products.

The PCR amplification of the ITS region (Figure 3-5) was conducted using primers designed for *Sorghum* (Table 3-3) that were made by the Oligonucleotide Synthesis Core Facilities, University of Florida (Sun, et al., 1994). The touchdown program for the PCR reaction (Table 3-4) is a modification of a Whitten protocol using a lid temperature of 110°C (Whitten, 1998).

Table 3-3. ITS Amplification Primer sequences.

Primer	Sequence
17SE (F)	ACGAATTCATGGTCCGGTGAAGTGTTCG
26SE (R)	TAGAATTCCCCGGTTCGCTCGCCGTTAC

(Sun, et al., 1994)

Table 3-4. Touchdown thermocycler program used for ITS amplification

Step	Temperature	Time	Function
#1	94°C	3 min.	DNA Premelt (add Taq)
#2	94°C	1 min.	Separate DNA strands
#3	76°C	1 min.; drop by 1°C each cycle	Primer annealing
#4	72°C	1 min.; cycle to #2 14 times	Strand extension
#5	94°C	1 min.	Separate DNA strands
#6	60°C	1 min.	Primer annealing
#7	72°C	1 min.; cycle to #5 14 times	Strand extension
#8	72°C	4 min.	Final extension
#9	4°C	hold	Stops reaction

(Whitten, 1998)

trnL-F region

Amplification of the *trnL-F* region (Figure 3-2) was conducted using universal primers (Table 3-5) designed for noncoding regions of the chloroplast genome (Taberlet, et al., 1991). The hot start program for the PCR reaction (Table 3-6) is a modification of a Whitten protocol that uses a lid temperature of 110°C (Whitten, 1998). The PCR product is approximately 1200 bases long.

Table 3-5. Primers for *trnL-F* amplification.

Primer	Sequence
C (F)	CGAAATCGGTAGACGCTACG
F (R)	ATTTGAACTGGTGACACGAG

Table 3-6. Hot start program used for *trnL-F* amplification

Step	Temperature	Time	Remark
#1	94°C	3 min.	Add Taq
#2	94°C	1 min.	
#3	58°C	1 min.	
#4	72°C	1 min.	Cycle to #2, 34 times
#5	72°C	4 min.	
#6	4°C	indefinite	

(Whitten, 1998)

matK gene

Amplification of the *matK* gene (plastid genome, Figure 3-2) was conducted using primers designed for epidendroid orchids (Table 3-7). The hot start protocol for the PCR reaction (Table 3-8) is a modification of a Whitten (1998) protocol using a lid temperature of 110°C. The PCR product is approximately 1460 base pairs (bp) long.

Table 3-7. Primers used for *matK* amplification

Primer	Sequence
56F	ACTTCCTCTATCCGCTACTCCTT
1520R	CGGATAATGTCCAAATACCAAATA

(Whitten, 1998)

Table 3-8. Hot start program used for *matK* amplification.

Step	Temperature	Time	Remark
#1	94°C	3 min.	Add Taq
#2	94°C	1 min.	
#3	51°C	1 min.	
#4	72°C	1 min.	Cycle to #2 34 times
#5	72°C	4 min.	
#6	4°C	indefinite	

(Whitten, 1998)

PCR cleaning

The PCR product was cleaned to remove excess Taq, primers, and other reagents. This was accomplished using a QIAquick PCR Purification Kit (Qiagen, Catalog #28104). This kit uses a three-step process to clean the PCR product. In the first step, the DNA adheres to the column membrane. The second step is a wash to remove impurities. The third step is a recovery process that elutes the DNA from the column membrane into a clean tube.

The modified protocol for the cleanup was as follows: The QIAquick spin column and a 1.5 ml tube were labeled with the specimen number. The spin column was placed in a 2 ml collection tube. Then 250 µl of Qiagen proprietary buffer (PB) was added to the

column followed by 50 µl of the PCR product. The collection tubes with spin columns were placed in the centrifuge and spun at 10,000 g for 1.0 minute. The flow-through from collection tubes was discarded and the spin columns were placed back into the collection tubes. Next 750 µl of the wash Qiagen buffer PE was added to each spin column and centrifuged at 10,000 rpm for one minute. The flow-through was discarded and columns placed back into the collection tubes. The tubes were spun again for another two minutes to remove all the excess wash buffer from the spin column. The spin column was placed in the clean, labeled 1.5 ml tube and the collection tube was discarded. Then 50 µl of Qiagen elution buffer (EB) was added directly to the membrane of each spin column. (If a lesser amount of EB is being used to concentrate the product, wait 60 seconds before spinning.) The 1.5 ml tubes with spin columns were placed into the centrifuge and spun for two minutes at 10,000 rpm. A 2 µl aliquot of each cleaned product was run on an agarose gel to verify recovery and to check concentration of the PCR product. At this stage, the PCR product is ready for cycle sequencing or storage at –20°C.

Cycle Sequencing

There are many different methods of sequencing DNA. Older “manual” methods involve the incorporation of radioactive phosphorus or sulfur into the DNA strands, followed by electrophoresis and exposing the gel on large sheets of X-ray film. These methods have two major drawbacks: (1) the hazards and costs of using radioactive materials and (2) the tedious reading of sequence data from the X-ray films. The present cycle sequencing method uses thermal cycling to incorporate fluorescent tags into the DNA strands (Sanger, et al., 1977). This method has several advantages over

manual sequencing in that it is faster, cheaper, and the sequence data are acquired and processed in a digital format.

The cycle sequencing reaction is essentially a second PCR reaction, with several differences. A single primer is used (rather than two). The DNA template is the purified PCR product. The PCR reaction mix consists of DNA template, primer, a special DNA polymerase, unlabeled dNTP's, fluorescently labeled ddNTP's, buffer, and ultrapure sterile water. The DNA polymerase used is "Amplitaq FS," a thermostable modified form of *Thermus aquaticus* DNA polymerase which is mass produced in *E. coli.* Amplitaq has no 3'-5' exonuclease activity. The template is copied as in standard PCR, but fluorescently labeled dye terminators are randomly incorporated into the copied DNA. Each of the four types of terminators (A,C,T,G) has a differently colored fluorescent tag. Because the incorporation of a dye terminator is a random process, the cycle sequencing reaction produces a population of DNA strands of different lengths, ranging from that of the primer up to 800 bases (or to the end of the PCR product). The resulting product is cleaned and dried. The product is then electrophoresed on a polyacrylamide gel in an ABI (Applied Biosystems, Inc.) Autosequencer (377) where they are separated by size (length). The gel can resolve single base differences in length. As the fragments pass by the spectrophotometer at the bottom of the gel, a laser and photocell measure the intensity and color of the band. These data inputs produce an electropherogram. The sequencer software interprets these and assigns a base to each colored peak and the raw data are outputted to a computer file. The sequence data files are edited and assembled into complete DNA sequences, and these consensus sequences are exported to a phylogenetic software package.

Sequencing protocol

The same basic steps are used for cycle sequencing all PCR products. The amplimers and internal primers are selected for each gene region to be sequenced. Internal primers are used when the DNA fragment exceeds 800 base pairs. A master mix of Big Dye™ Terminator (ABI), sequencing buffer, primer, and molecular grade water is mixed in the proportions of Table 3-9. The cycle sequencing protocol uses a 20 μl reaction containing 1 μl of template and 19 μl of master mix which is set up in the thermocycler block chilled to 4°C to prevent evaporation while setting up the reaction. The thermocycler program, Table 3-10, is the 25-cycle protocol recommended by ABI (1995). The cycle sequencing products are cleaned and dried before being sent to the DNA Sequencing Core Lab (University of Florida) for automated sequencing.

Table 3-9 Cycling sequencing master mix.

Reagent	Quantity
Terminator Mix	1.0 μl
Buffer 5X	3.5 μl
Primer*	1.0 μl
Water	13.5 μl
Total	19 μl

*1 pmol/μl

Table 3-10. Thermocycler program for cycle sequencing.

Step	Temp.	Time
#1	96°C	2 minutes
#2	96°C	10 seconds
#3	50°C	5 seconds
#4	60°C	4 minutes
#5		repeat steps 2-4 for 25 cycles
#6	4°C	hold

Sequencing primers

The primers used for cycle sequencing are listed as follows: Table 3-11, ITS; Table 3-12, *matK*; Table 3-13, *trnL-F*. The primers used in sequencing reactions are

one-tenth the concentration of primers used for regular PCR. The primers were synthesized by the Oligonucleotide Synthesis Core Facilities, University of Florida.

Table 3-11. Primers used for ITS sequencing.

Primer	Sequence
ITS 5 (F)	GGAAGTAAAAGTCGTAACAAG
ITS 4 (R)	TCCTCCGCTTATTGATATGC

(Baldwin, 1992)

Table 3-12 Primers used for *trnL-F* sequencing.

Primer	Sequence
C (F)	CGAAATCGGTAGACGCTACG
D (R)	GGGGATAGAGGGACTTGAAC
E (F)	GGTTCAAGTCCCTCTATCCC
F (R)	ATTTGAACTGGTGACACGAG

(Taberlet, et al., 1991)

Table 3-13 Primers used for *matK* sequencing.

Primer	Sequence
56 (F)	ACTTCCTCTATCCGCTACTCCTT
749 (F)	TTGAGCGAACACATTTTCTATGGAA
832 (R)	ACATAATGTATGAAAGTATMTTTGA
1520 (R)	CGGATAATGTCCAAATACCAAATA

(Whitten, 1998)

Cycle sequencing cleaning

To clean the cycle sequencing product, the fluorescently-labeled DNA strands were precipitated with ethanol, centrifuged, washed with 70% ethanol, and dried. A precipitation solution was made with 1000 µl of 100% ethanol and 40 µl of 3.0 M Sodium Acetate. Next 52 µl was aliquoted into a 1.5 ml tube and the 20 µl cycle sequencing product was added. The tube was placed on ice or in the freezer for 15 minutes to precipitate the DNA. The tubes were centrifuged for 20 minutes at 10,000 rpm to form a minute pellet. The ethanol was drained from the tube and 250 µl of 70% ethanol was gently added to the tube. The tube was inverted to wash the sides and then tube was drained on a paper towel. This step was repeated for a second wash to remove excess

reagents. The tubes were placed in the CentroVap at 65° C and dried for ten minutes, or until no liquid was visible. The samples are now ready to store in the dark at –20° C until sent to the sequencing facility where they will be resuspended and loaded into the automated sequencer.

Automated sequencing

The DNA Sequencing Core Lab at the University of Florida uses an automated fluorescent dye-terminator cycle sequencing technique based on the chain-termination dideoxynucleotide method of Sanger (Sanger, et al., 1977). The automated sequencing protocol, as developed by Perkin-Elmer for use on the ABI 377 Sequencer, uses PCR to incorporate dideoxynucleotides which contain fluorescent dyes (Big Dye™) in a primer extension sequencing reaction. The reaction mix contains a population of PCR fragments of different lengths, each terminating in a fluorescent-dye-containing dideoxynucleotide. Each terminal dideoxynucleotide base contains a different fluorescent dye which emits a characteristic wavelength, thus the identity of the dye corresponds to the final base on that fragment. The cycle sequencing reaction products are electrophoresed in a single lane of a polyacrylamide gel in an ABI 377 Sequencer, so that the fragments separate according to size. As the fragments run past a laser detector at the bottom of the vertical gel, the emission wavelength of each fragment termination is detected as a chromatogram. The output file is sent to the end user for editing and assembly.

Data Processing

The raw data from the automated sequencer must be edited and assembled into complete DNA sequences. These sequences then must be aligned in a NEXUS matrix before an analysis can begin. The editing and alignment of DNA sequences may be considered as subjective changes to the raw data. However, with experience the scientist finds little subjectivity in these procedures.

Sequence editing

The raw electropherograms from the automated sequencer must be edited before assembled into complete sequences. The electropherograms were edited with Sequence Navigator 1.01 (Applied Biosystems, 1994b). The beginning section often has dye blobs that obscure the sequence. These are cut off or they can be edited if good sequence peaks are available. The end of the electropherogram is cut off where the sequence ends or sooner if the peaks have degenerated. There are other portions of the electropherogram that may require editing. The automated sequencer assigns a base call of N when it is uncertain of the base. This can occur in a weak or polymorphic region. The automated sequencer can also miscall a base (an error) where a strong signal precedes a weak signal. Another troublesome region is one of multiple repeats of the same base. This can cause the electropherogram to stutter. If this occurs, all sequence after the stutter must be discarded. The electropherogram does not need to be completely edited since the assembly software allows some errors.

Sequence assembly

The sequence fragments were assembled using AutoAssembler 1.30 (Applied Biosystems, 1994a). The fragments are imported in the application where the amount of overlap and ambiguity are set for assembly. Typically, the overlap is set to 50 bp with 20% ambiguity. Once assembled and before any editing, the assembly must be closely examined to determine that the primer fragments are going the correction direction and that the overlap occurs at the correct portion of the sequence. If an error in assembly occurs the assembly parameters must be changed (tightened) and the fragments reassembled. The other problem is one where the fragments will not assemble. The parameters may need to be less constraining or the electropherograms may require more editing. The assembly problem may be caused by DNA segments that do not overlap. If this occurs, a consensus sequence from a closely related taxon may be used as a temporary bridge to tie the fragments together.

Once the correct assembly is completed, additional editing is normally required. Base miscalls are the problems typically found in the electropherograms. However, polymorphic sites can occur and these are coded with the appropriate ambiguity code. Occasionally, the automated sequencer will miss (skip) a base call and it must be manually entered. After editing is complete, a DNA consensus file is generated and exported as a text file.

Data matrix

The NEXUS file format is a shared file format used by many phylogenetic programs (Maddison, et al., 1997). The NEXUS file is essentially a text file with tokens that can be edited with any text editor. However, alignment of the DNA sequences

requires a line length that exceeds the text window. For this reason, PAUP* 4.0 was used to build and align the NEXUS file for DNA analysis.

The alignment procedure is to arrange the sequences for a vertical alignment of similar patterns by inserting gaps (-) into the sequence. Coding regions are easier to align because the indels are constrained to multiples of three. This constraint is absent in spacer regions making the alignment more difficult. An excessive number of gaps in an alignment can obscure the phylogenetic signal. Alignment of DNA sequences is analogous to the question of homology in a morphological matrix. When variation occurs, the alignment reflects the interpretation of that event as a mutation, deletion or an insertion. This is accomplished by observation of the overall pattern of all the sequences in the matrix and the alignment can change as taxa are added.

Seven outgroup ITS sequences were contributed to this study by other scientists. The *Restrepiella ophiocephala* sequence was donated by Alec Pridgeon, *Hexadesmia* and *Psychilis krugii* sequences were donated by Cassio van den Berg, *Hexisea imbricata*, *Jacquiniella teretifolia*, *Scaphyglottis pulchella*, and *Reichenbachanthus* sequences were donated by W. Mark Whitten.

DNA Analysis

The type of analysis used for a DNA matrix varies with the philosophy of the scientist. The methods available are parsimony, maximum likelihood, and distance methods. The distance method is based on the overall similarity of the sequences. Maximum likelihood is also a distance method but it uses a model for DNA evolution. Ockham's razor is the scientific principal not to generate a hypothesis more complex than necessary to explain the observations (Judd, et al., 1999). Parsimony methods

meet this criterion. The parsimony method is based on shared evolved characters where the shortest topologies are considered the most parsimonious. Parsimony methods generally perform well outside of the Felsenstein zone (long-branch attraction) (Wiens and Servadio, 1998). Parsimony was selected as the method of choice for this study.

Parsimony Analysis

PAUP* 4.0 was chosen as the computer software to conduct the analyses. There are three options for parsimony analyses in PAUP: Exhaustive, Branch-and-bound, and Heuristic. Exhaustive and Branch-and-bound searches are guaranteed to find the shortest tree(s), but they can only be used for a small matrix (20 or fewer taxa). The number of characters in a matrix is not as important as the number of taxa in relation to the amount of time required to complete a search. Thus, a matrix of 66 taxa must use the heuristic algorithm.

Since Heuristic searches are a random process, the shortest trees may not be discovered in one round of tree assembly and branch swapping. Maddison (1991) showed the existence of multiple "islands" of equally parsimonious (shortest) trees. Branch swapping on a single starting tree will only find the "local" shortest trees. The algorithm may need to traverse longer trees before descending onto islands of even shorter trees. This phenomenon is caused by the way PAUP constructs starting trees by a simple distance calculation. The topology of the starting tree is sensitive to taxon entry order. To overcome this starting tree sensitivity, searches are setup to do many replicates with random entry order of taxa. There is the potential for multiple islands of

trees in the data set if the analyses produces trees with a RI of less than 0.68 and the number of terminal taxa is greater than 20 (Maddison, 1991).

There are three options for branch swapping algorithms in PAUP: Nearest Neighbor Interchange (NNI), Subtree Pruning-Regrafting (SPR), and Tree Bisection-Reconnection (TBR). The NNI algorithm is a subset of the SPR algorithm and the SPR algorithm is a subset of the TBR algorithm. There may be hidden trees on an island because of the way PAUP saves trees. When PAUP saves a tree, it collapses zero length branches (forming polytomies). When the tree is retrieved PAUP returns it to a dichotomous form. Since there are several arrangements possible when a polytomous tree is de-collapsed, the original tree may be lost. Use of the most inclusive branch-swapping algorithm (TBR), decreases the possibility of having hidden trees (Farris, 1969).

The recommended settings for heuristic searches are: 1000 replicates, generating the starting trees by random stepwise addition, TBR branch swapping, saving MULTREES but no more than 10 trees per replicate less than or equal to the shortest tree. Gaps in the matrix are treated as "missing". DNA ambiguity codes are converted to multi-state taxa with an "{or}" interpretation using the DNA macro in PAUP. The starting trees for the heuristic search are obtained via stepwise addition using random addition sequence. This procedure should be repeated until each island has been discovered 10 times (Farris, 1969). Once the shortest tree lengths for the data matrix have been found, use these trees as starting trees and search again (remove tree save limit) to collect all the trees of that length.

Successive Weighting is a method to assign weights to characters without *a priori* judgements. The initial trees from the equally weighted search produce character consistencies that provide a measure of cladistic reliability (Farris, 1969). These indices

(RC) are used to assign weights to the characters. The initial analysis establishes which are the "good" and which are the "bad" characters (homoplasious characters are assumed to be "bad"). The analysis is rerun and is followed by successive rounds of re-weighting and followed by analyses until the tree statistics become stable. This process fits the best characters onto the trees more parsimoniously, at the expense of the homoplasious characters. The final weighted trees are generally only 0-2 steps longer than the shortest equal-weight trees, or if they are the same length as the equal-weighted trees, they are a subset of the equal-weighted trees.

After doing the initial analysis and reweighting the characters using RC and a base weight of 1000, one should record the tree length, CI, RI, and RC. Repeat the analysis and compare to previous length, CI, RI, and RC. Continue to reweight characters and reanalyze until the tree statistics are unchanged between analyses. Save the current assumptions and apply these weights when beginning bootstrap analyses. The resulting trees have huge branch lengths because the successive reweighting uses a scale of 0-1000. In order to observe a tree with "normal" branch lengths, the character weights are reset to one before the tree is printed.

Bootstrap Analysis

The bootstrap analysis replaces 50% of the DNA characters with random character states selected from the matrix. A heuristic search of 10 repetitions holding 10 trees, follows each of the 1000 replicates of random replacement. The branch-swapping algorithm was changed to nearest-neighbor interchange (NNI). A bootstrap analysis produces a consensus tree that indicates the percentage of replicates that each clade was present following the replacement of data. The bootstrap consensus tree must be

printed or saved as a "*.pct" file because PAUP does not save the results of a bootstrap analysis.

Decay Analysis

The Decay index (Bremer support) is a measure of the presence of a clade in longer trees (Bremer, 1994). AutoDecay (Eriksson, 1998) was used to determine the number of steps that support each clade. The analysis was run for 100 replicates for each of the 63 constraint trees using the HSEARCH parameters ADDSEQ=random, NREPS=100, RSEED=1, NCHUCK=10, and CHUCKSCORE=222. The output of AutoDecay is a text file of decay values and a tree file that can be viewed with TreeView (Page, 1996).

Indel Matrix

Indels are insertions and/or deletions in the DNA sequence represented by gaps (-) in the matrix. PAUP has two ways to analyze these gaps, as missing data or as evolutionary events. Normally, the indels are analyzed as missing data because PAUP considers each base gap as an evolutionary event. This is highly unlikely in coding regions since the indels must be multiples of three to preserve the reading frame. Taxa that share an indel have a common character that is overlooked unless a separate matrix for indels is constructed. The insertions or deletions in the DNA sequence of the *matK* and *trnL-F* region were coded into a separate matrix (Table 3-14). Only indels of three or more bases were coded. Single or double base indels and regions of repeated

bases were not coded to avoid possible errors introduced by the Taq polymerase during sequencing. Single-base indels are more probable in non-coding regions.

Molecular Results

The results of the analyses are best presented in visual format. These results of the molecular analyses are summarized in tables for easy comparison. Table 3-15 lists the basic positional information for each matrix along with statistics for the equal-weighted searches. Table 3-16 presents the statistical results for the weighted analyses.

Table 3-15. Statistical results of the equally weighted DNA analyses.

Matrix	**ITS**	***trnL-F***	***matK***	**Indel**
Positions	744	1680	1441	52
Variable sites	319	474	404	52
Informative sites	204	171	208	26
Trees	104200	117300	104500	660
Steps	957	713	956	63
RI	0.488	0.762	0.514	0.825
CI	0.575	0.664	0.525	0.833
RC	0.280	0.506/	0.269	0.688

Table 3-16. Statistical results of weighted DNA analyses.

Matrix	**ITS**	***trnL-F***	***matK***	**Indel**
Trees	20	6210	100	14
Steps (rescaled)	961	711	963	63
RI	0.773	0.956	0.890	0.955
CI	0.738	0.908	0.838	0.952
RC	0.571	0.868	0.746	0.909

Nuclear Results

The strict consensus of the 104200 trees for the equally weighted ITS analysis is presented in Figure 3-9. The weighted analysis produced 20 equally parsimonious trees. The strict consensus with bootstrap and decay indices is presented in Figure 3-

10. Figure 3-11 is a randomly selected tree showing branch lengths. The DNA base composition for the ITS matrix is shown in Figure 3-15. The transition/transversion ratios for ITS 1, 5.8S, and ITS 2 are presented in Figures 3-12, 3-13, 3-14 respectively. *Encyclia tampensis* was chosen as a representative species for DNA composition analysis (Cox, 1997). A window size of 50 bp with a step of 10 bp was used to perform all the DNA composition analyses. The deviation from |A|=|T|: (A-T)/(A+T) is charted in Figure 3-16, deviation from |C|=|G|: (C-G)/(C+G) is charted in Figure 3-17, and the GC content: (G+C)/(A+T+C+G) percentage is charted in Figure 3-18.

Plastid Results

The results of the *trnL*, *matK*, and indel analyses are not presented as individual trees but will be presented in the combined plastid results.

trnL results

The DNA base composition for the *trnL-F* matrix is shown in Figure 3-22. The transition/transversion ratios for *trnL* intron, *trnL* 3' exon, and intergenic spacer are presented in Figures 3-19, 3-20, & 3-21 respectively. *Encyclia tampensis* was chosen as a representative species for DNA composition analysis. The three indices of base frequency are the *trnL* |A|=|T| deviation is charted in Figure 3-23, |C|=|G| deviation is charted in Figure 3-24, and the GC content percentage is charted in Figure 3-25.

matK results

The DNA base composition for the matK matrix is shown in Figure 3-27. The transition/transversion ratios for *matK* are presented in Figure 3-24. *Encyclia tampensis*

was chosen as a representative species for DNA composition analysis. The *matK* (A-T)/(A+T) deviation is plotted in Figure 3-28, (C-G)/(C+G) is plotted in Figure 3-29, and (G+C)/(A+T+C+G) percentage is plotted in Figure 3-30.

Combined plastid results

The equal-weighted combined plastid analysis of *matK*, *trnL-F*, and indels produced 170 equally parsimonious trees of 1521 steps. The weighted analysis reduced the number of trees to 10 with the following statistics: RI = 0.936, CI = 0.878, and RC = 0.822. The strict consensus with bootstrap and decay indices is presented in Figure 3-31.

DNA Discussion

The discussion of DNA results is separated into nuclear and plastid components. The reasoning for this is the different patterns of inheritance in the genomes, the nuclear genome being biparental and the chloroplast genome being uniparental (usually maternal). All three gene regions had a retention index less than 0.68 indicating the potential for multiple islands of equally parsimonious trees.

ITS Discussion

The topology of the cladogram resulting from the ITS analysis (Figure 3-10) supports *Encyclia* sections *Osmophytum*, *Dinema*, and *Euchile* as independent clades. The monophyly of section *Encyclia* is supported with the exception of *E. kienastii*. *Encyclia kienastii* is sister to *Hagsatera*, which was included in *Encyclia* by Dressler.

Section *Encyclia* (less *E. kienastii*) has strong bootstrap support (96) and decay support (2.36). Section *Euchile* is sister to *Meiracyllium* and section *Dinema* is sister to *Nidema*. Section *Leptophyllum* is dispersed across the subtribe. *Encyclia subulatifolia* is imbedded in *Epidendrum*; *Encyclia cyanocolumna* and *E. tenuissima* are sister to section *Osmophytum*; and *E. luteorosea* is sister to the subtribe.

The tree length for the weighted analysis was rescaled to compare to the equal-weighted trees by using equal-weighted characters. The weighted ITS trees are 4 steps longer than equal weighted. However, the other tree statistics (RI, CI, RC) are higher (Table 3-16). The equal-weighted statistics (RI, CI, RC) suggest that the ITS characters are quite homoplasious across the subtribe (Table 3-15).

The A-T or G-C content changes along a DNA sequences is known to directly affect the base substitution processes (Lobry, 1996). It may also help to identify coding from non-coding regions. The ITS region is CG rich (Figure 3-15). The 5.8S gene of ribosomal DNA occurs at positions 274-437 in the ITS matrix. The three indices of base frequency are plotted in Figures 3-16, 3-17, and 3-18. There are two classes of base pair bonding, pyrimidines and purines. Likewise, there are two types of DNA base change mutations, transitions or transversions. Transitions are changes within pyrimidines or purines and transversions are changes between classes. Transitions generally occur more readily than transversions (Doyle, 1993). The transition/transversion ratios for ITS 1, 5.8S, and ITS 2 have been charted independently in Figures 3-12, 3-13, & 3-14 respectively. It is noteworthy that in the 5.8S coding region the only changes were A->C, A->G, C->A, C->T, G->A, or T->C. The numerical values and standard deviation for these plots is located in the Appendix D.

Plastid Discussion

The plastid analysis (Figure 3-31) supports *Encyclia* sections *Osmophytum*, *Euchile*, *Dinema*, and most of section *Encyclia*. *Encyclia dichroma*, *E. candollei*, *E. kienastii* and *E. randii* are separated from the rest of section *Encyclia*. *Encyclia dichroma* and *E. candollei*, are sister to Laeliinae. *Encyclia randii* is sister to *Schomburgkia*. This topology can be traced to the *matK* gene, and placement may suggest a hybrid origin for these species since plastid DNA is maternally inherited. *Encyclia* section *Leptophyllum* is polyphyletic. *Encyclia luteorosea* is sister to the clade comprised by *Homalopetalum* and *Domingoa*. *Encyclia subulatifolia* is sister to the clade of comprised of section *Euchile*, section *Osmophytum*, section *Encyclia*, and *E. kienastii*. Section *Euchile* is sister to section *Osmophytum*. *Encyclia* sections *Osmophytum* and *Euchile* have strong bootstrap support and limited decay support. The weighted plastid tree has the same number of steps as the equal-weighted tree. However, weighting reduced the number of equally parsimonious trees from 170 to 10.

***trnL-F* discussion**

The *trnL-F* region is AT rich (Figure 3-22). The transition/transversion ratios *trnL-F* region are charted independently for the *trnL* intron, *trnL* 3' exon, and *trnL* spacer in Figures 3-19, 3-20, 3-21. The coding region (*trnL* exon) only had changes from A->C, A->G, T->A, or T->G. The *trnL* spacer and intron regions had similar patters of replacement. The *trnL* 3' exon is located at positions 1019->1068 in the *trnL* matrix. The AT deviation, CG deviation, and GC content are plotted in Figures 3-21, 3-22, 3-23. The numerical values and standard deviation for these plots are located in the Appendix E.

matK discussion

The *matK* region is also AT rich (Figure 3-27). The *matK* transition/transversion ratios in Figure 3-26 exhibit a more balanced pattern than the other coding regions, 5.8S and *trnL* exon. It is interesting that the AT deviation, CG deviation, and GC content charted in Figures 3-28, 3-29, & 3-30 also show a more uniform pattern than the other DNA regions examined, ITS and *tmL-F*. This may suggest relaxed constraints on gene mutation. The numerical values and standard deviation for these plots are located in the Appendix F.

Indel discussion

The weighted indel analysis produced fewer trees of equal length to the equal-weighted analysis. The weighted tree statistics also were higher than the equal-weighted statistics. The improved statistics and smaller number of trees is due to the down-weighting of homoplasious characters. The indels provided resolution for *Encyclia* section *Encyclia* and for the subtribe Laeliinae. This will be discussed in detail in the Character Evolution section of the Combined Analysis chapter.

Table 3-14. Indel Matrix

Taxon	Indels
Restrepiella ophiocephala	00100100000000010010001000000000000000000000000000000000
Pleurothallis racemiflora	00100000010000000010000000000000000000000011000000101000
Ponera striata	00000000000001110001100000000011000100000000000000000000
Isochilus major	00000000000001110001001000000000000100000000000000000000
Epidendrum ibaguense	00000000010000011000000001001000000001100000000000000000
Epidendrum conopseum	00000000000000011000000000000000001001000000000000000000
Nidema boothii	00000000000000011000000000000000000000000000000001000000
Scaphyglottis pulchella	00001000000000011000000000000000000000000000000000000000
Hexisea imbricata	00000000000000011000000000000000000000000000000000000000
Reichenbachanthus species	10000000000000011000000000000000010000000000000000000000
Hexadesmia species	00000000000000011000000000000000000000000000000000000000
Acrorchis roseola	00000000000000011000000000000000000000000000000000100000
Jacquiniella teretifolia	00000000000000011000000000000000000000000000000000100000
Hagsatera brachycolumna	00000000000000011000000000000000000000000000000000000000
Homalopetalum pumilio	00000010000100011000000000000001000000000000000000000000
Meiracyllium trinasutum	00000000000000001000000010000000100000000000000000000000
Psychilis mcconnelliae	00000001000000011000000000100000000000000000000000000001
Psychilis krugii	00000001000000011000000000100000000000000000000000000001
Broughtonia negrilensis	00000000000000011000000000000000000000000000000000000001
Tetramicra elegans	00000000000000011000000000000000000000000000000000000000
Domingoa kienastii	00000000000000011000000000000000000000000000000000000000
Cattleyopsis lindenii	00000000000000011000000100000000000000000000001100000001
Brassavola cucullata	00000000000000011000000000000000000000000000000000000000
Laelia rubescens	00000000000000011000000000000000000000000000000000000000
Myrmecophila tibicinis	00000000000000001000000000000000000001000000000000000000
Cattleya dowiana	00000000000000011000100000000000000000000000000000000000
Rhyncholaelia glauca	00000000000000011000000000000000000000000000000000000000
Cattleya forbesii	00000000000000011000000000000000000000000000000000000000
Sophronitis cernua	00000000000000011000000000000000000000000010000000000000
Laelia purpurata	00000000000000001000000000000000000000000000000000000000
Schomburgkia splendida	00000000000000011000000000000000000000000000000000000000
Encyclia citrina	00000000000000011000000000000000000000000000000000000000
Encyclia mariae	00000000000000011000000000000000000000000000000000000000
Encyclia mariae	00000000000000011000000000000000000000000000000000000000
Encyclia polybulbon	00000000000000011000000000000000000000000000000000000000
Encyclia polybulbon	00000000000000011000000000000000000000000000000000000000
Encyclia adenocaula	00000000000000011000000000000000000100000000100000000000
Encyclia bractescens	00000000000000011000000001000000000010000000010000000010
Encyclia aromatica	00000000000000011000000001000000000010000000010000000000
Encyclia cordigera	00000000000000011000000000000000000000000000010000000000
Encyclia tampensis	00000000000000011000000001000000000010000000010000000000
Encyclia tampensis alba	00000000000000011000000001000000000010000000010000000000
Encyclia dichroma	00000000000000011000000001000000000010010000010000000100
Encyclia diurna	00000000000000011000000001000000000010000000010000000000
Encyclia asperula	00000000000000011000000001000000000010000000010000000000
Encyclia candollei	00000000000000011000000001000000000010000000010000000100
Encyclia randii	00010000000000011000000001000000000010000000010000000000
Encyclia kienastii	00000000000000011000000000000000000000000000000000000000

Table 3-14—continued.

Taxon	Indels
Encyclia chimborazoensis	0100000000000001100000000000000000000000000000000000
Encyclia fragrans	0000000000000001100000000000000000000000000000000000
Encyclia aemula	0000000000000001100000000000000000000000000000000000
Encyclia cochleata	0000000000000001100000000010000000000010000000000000
Encyclia pygmaea	0000000000000001100000000000000000000000010000000000
Encyclia pseudopygmaea	0000000000000001100000000000000000000000010000000000
Encyclia vitellina	0000000000000001100000000000000000000010000000000000
Encyclia glauca	0000000000000001100000000000000000000100000000110000
Encyclia ionocentra	0000000000000001100000000000000000001000000000000000
Encyclia prismatocarpa	0000000000000001100000000000000000000100000000000000
Encyclia ochracea	0000000000000001100000000000000000000000000000000000
Encyclia cretacea	0000000000000001100000000000000000000000000000000000
Encyclia luteorosea	0000000000000001100000000000000000000000000000000000
Encyclia luteorosea	0000000000000001100000000000000000000000000000000000
Encyclia subulatifolia	0000000000000001100000000000000000000000000010000000
Encyclia subulatifolia	0000000000000001100000000000000000000000000010000000
Encyclia cyanocolumna	0000000000000001100000000000000000000000000000000000
Encyclia tenuissima	0000000000100001100000000000000000000000000000000000

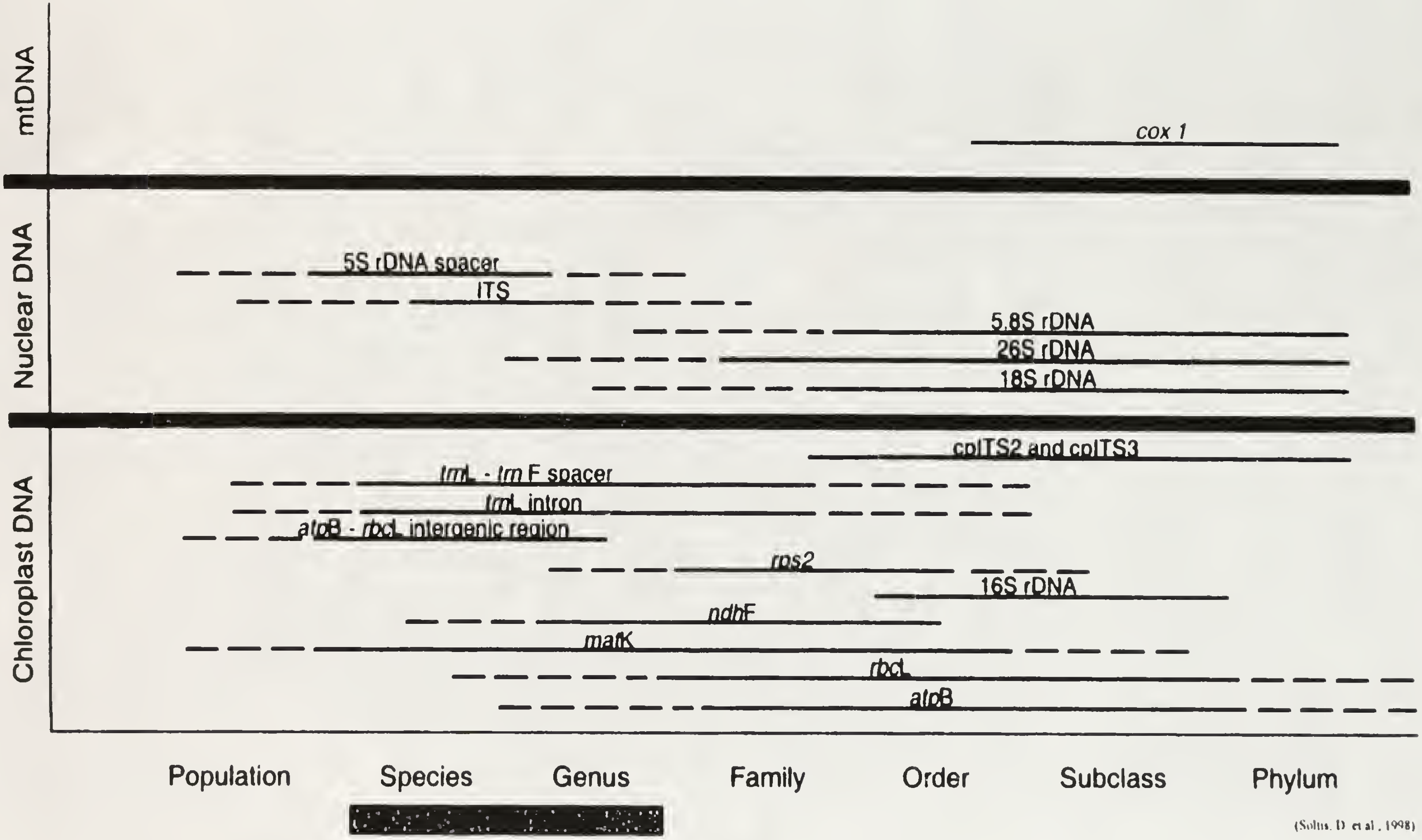

Figure 3-1. Taxonomic Level of Utility. The region of interest is indicated by the shaded bar.

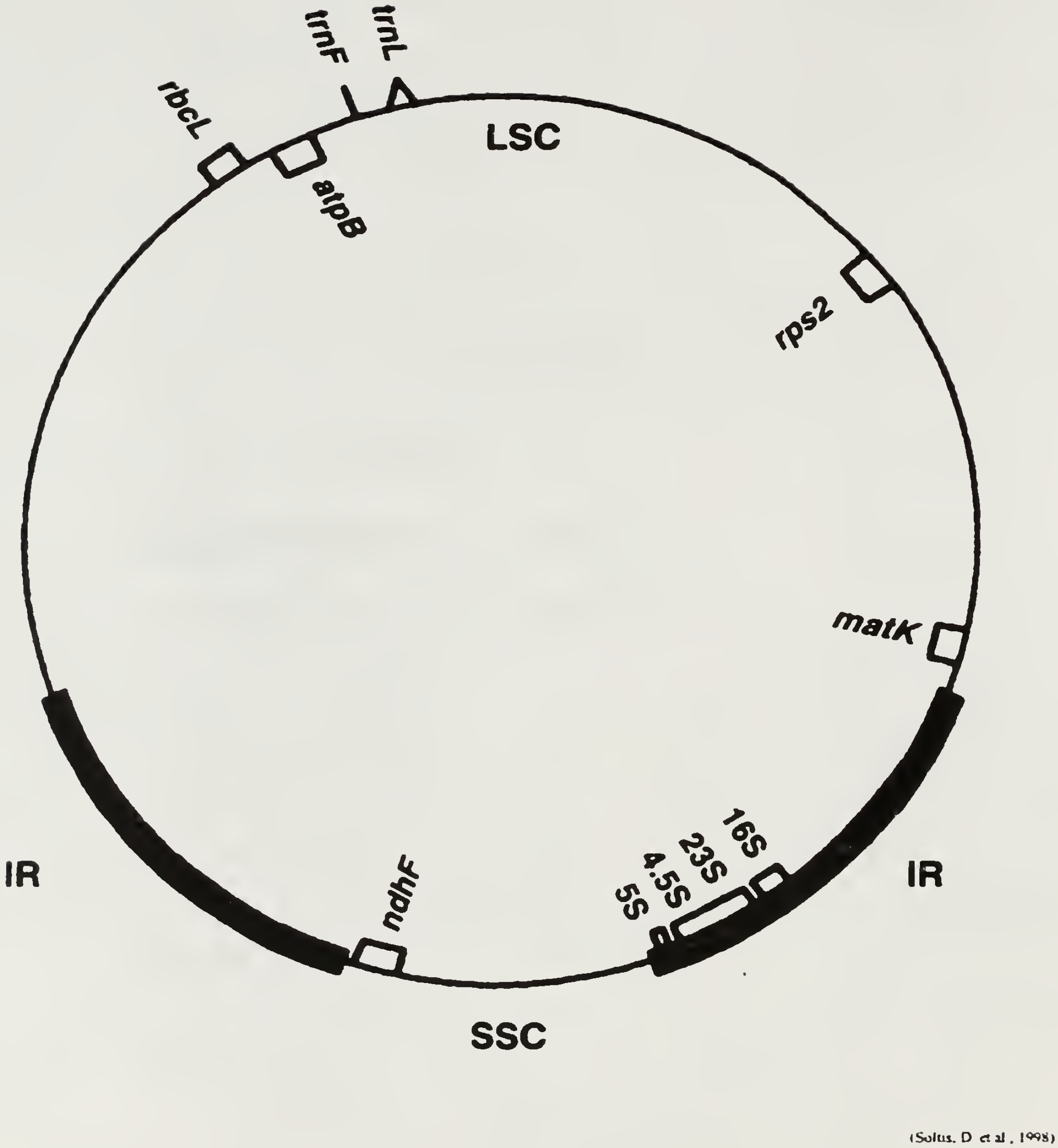

Figure 3-2. The chloroplast genome showing Large Single Copy (LSC) region, the Small Single Copy (SSC) region, and the Inverted Repeats (IR). The positions of the *trnL* and *matK* genes are indicated in the LSC.

Figure 3-3. Total DNA. Assessment of high molecule weight DNA quality by intercalated EtBr in an agarose gel viewed on an UV illuminator.

Figure 3-4. PCR Product. Assessment of the quality of the PCR product intercalated with EtBr in an agarose gel on an UV illuminator.

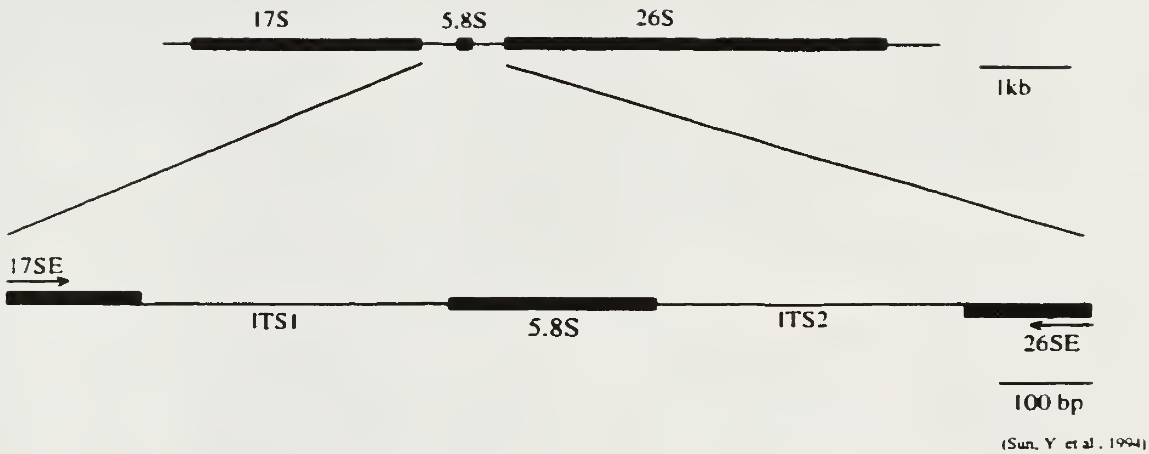

Figure 3-5. The ITS region showing the primers (17SE and 26SE) used in amplification of nuclear rDNA. The arrows indicate the location of primers and their direction. Thick lines are coding regions and thin lines are spacer regions.

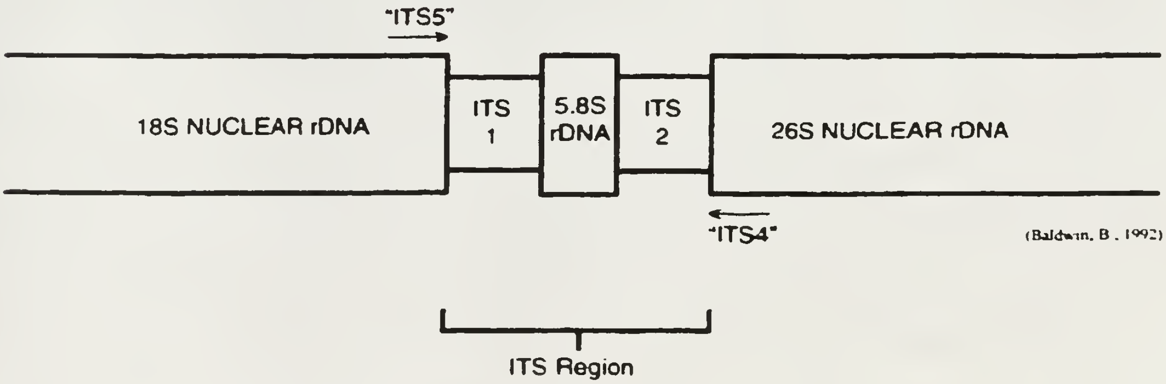

Figure 3-6. The ITS rDNA region showing the primers used in sequencing. The arrows indicate the approximate location and direction of primers. ITS 1 and 2 are the spacer regions sequenced along with 5.8S gene.

Figure 3-7. The *trnL-F* region showing the location of the primers used for amplification and sequencing. The arrows indicate the direction of primers.

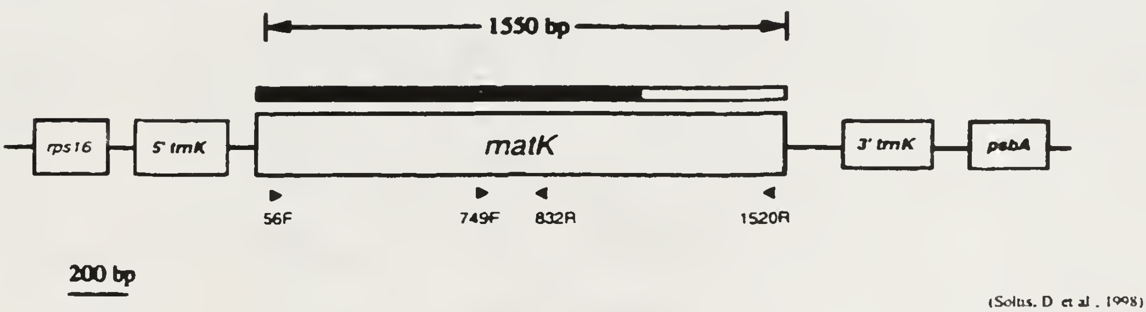

Figure 3-8. The *matK* region of the plastid genome. The arrow heads indicate the location of primers and their direction.

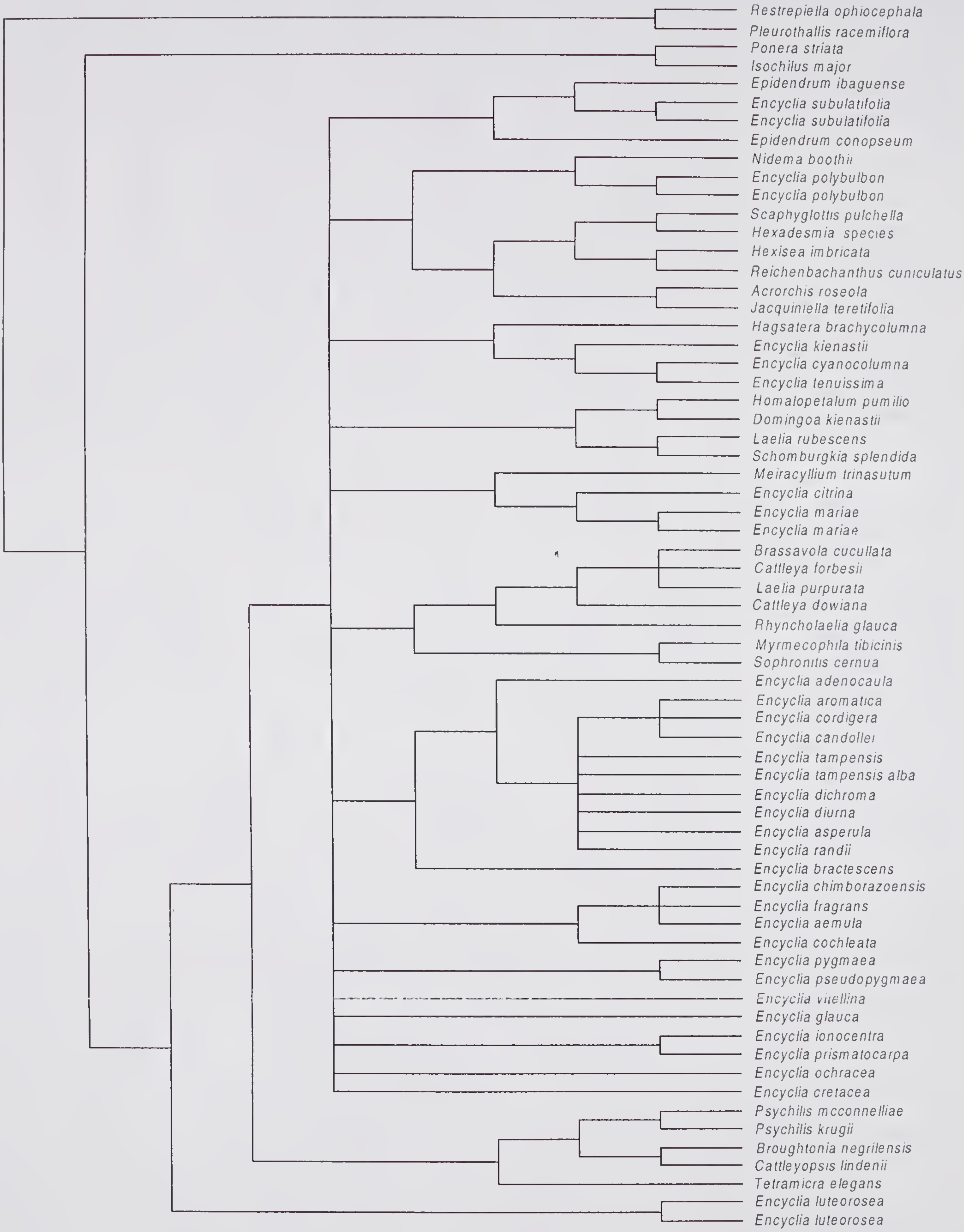

Figure 3-9. Equally weighted ITS strict consensus tree for 104200 trees. L=957, CI=0.575, RI=0.488, RC= 0.280.

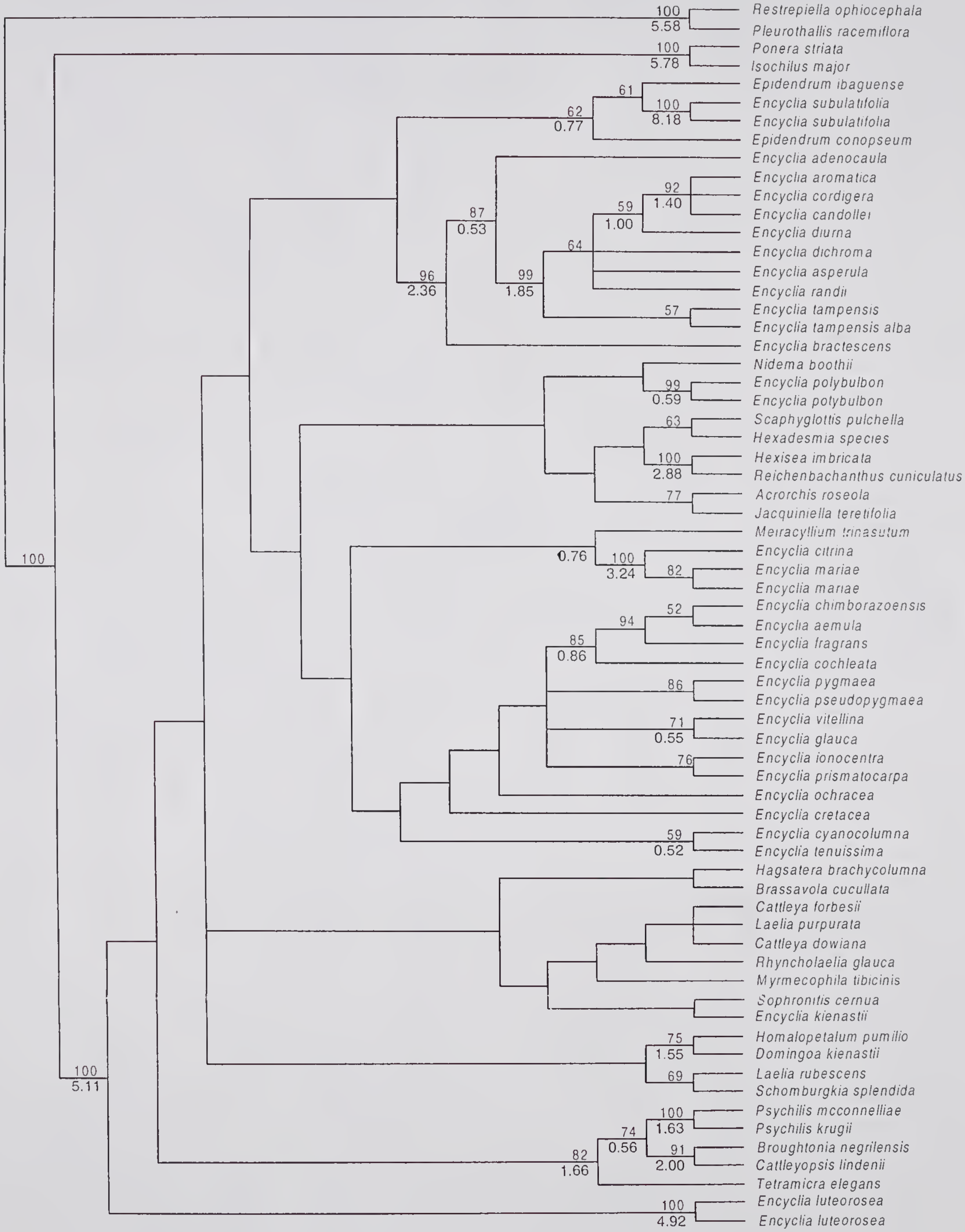

Figure 3-10. Weighted ITS strict consensus tree for 20 equally parsimonious trees (L=961, CI=0.738, RI=0.773, RC= 0.571). Bootstrap percentages greater than 50 percent are given above the line. Decay indices greater than 0.5 steps are indicated below the line.

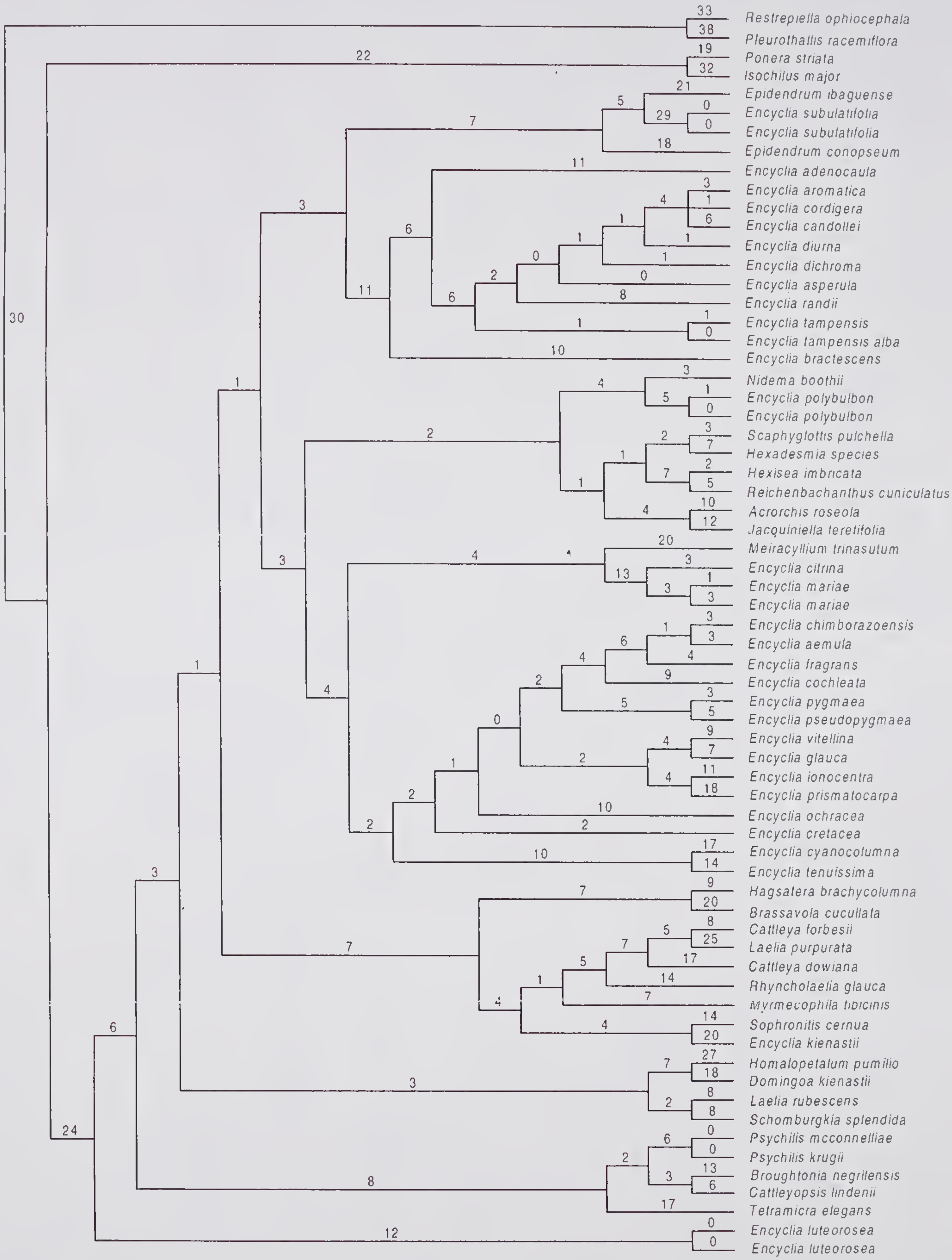

Figure 3-11. Randomly selected tree for ITS. The branch lengths are indicated in number of steps.

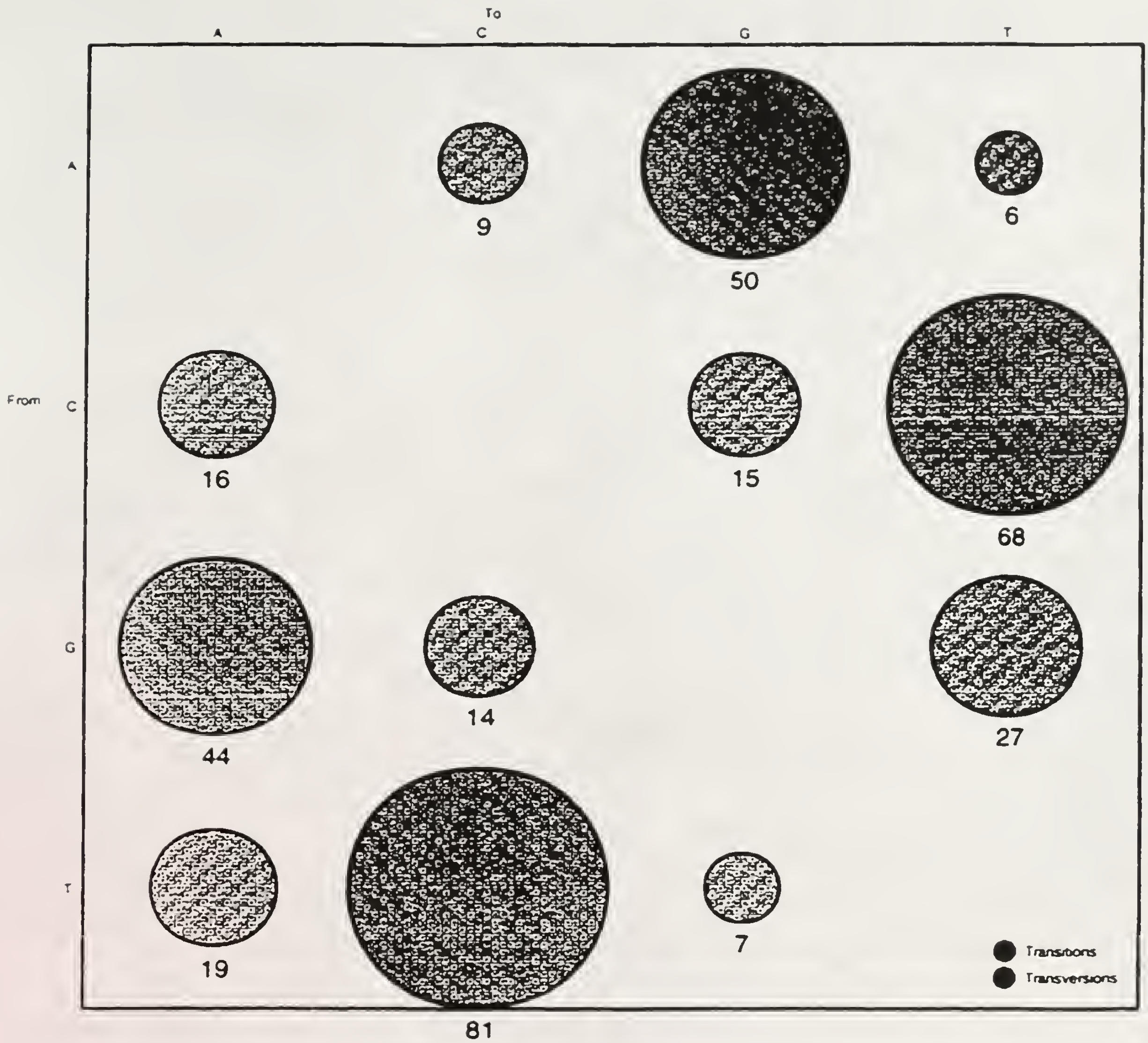

Figure 3-12. ITS 1 Transitions/Transversions. Frequency of unambiguous changes between states in ITS 1.

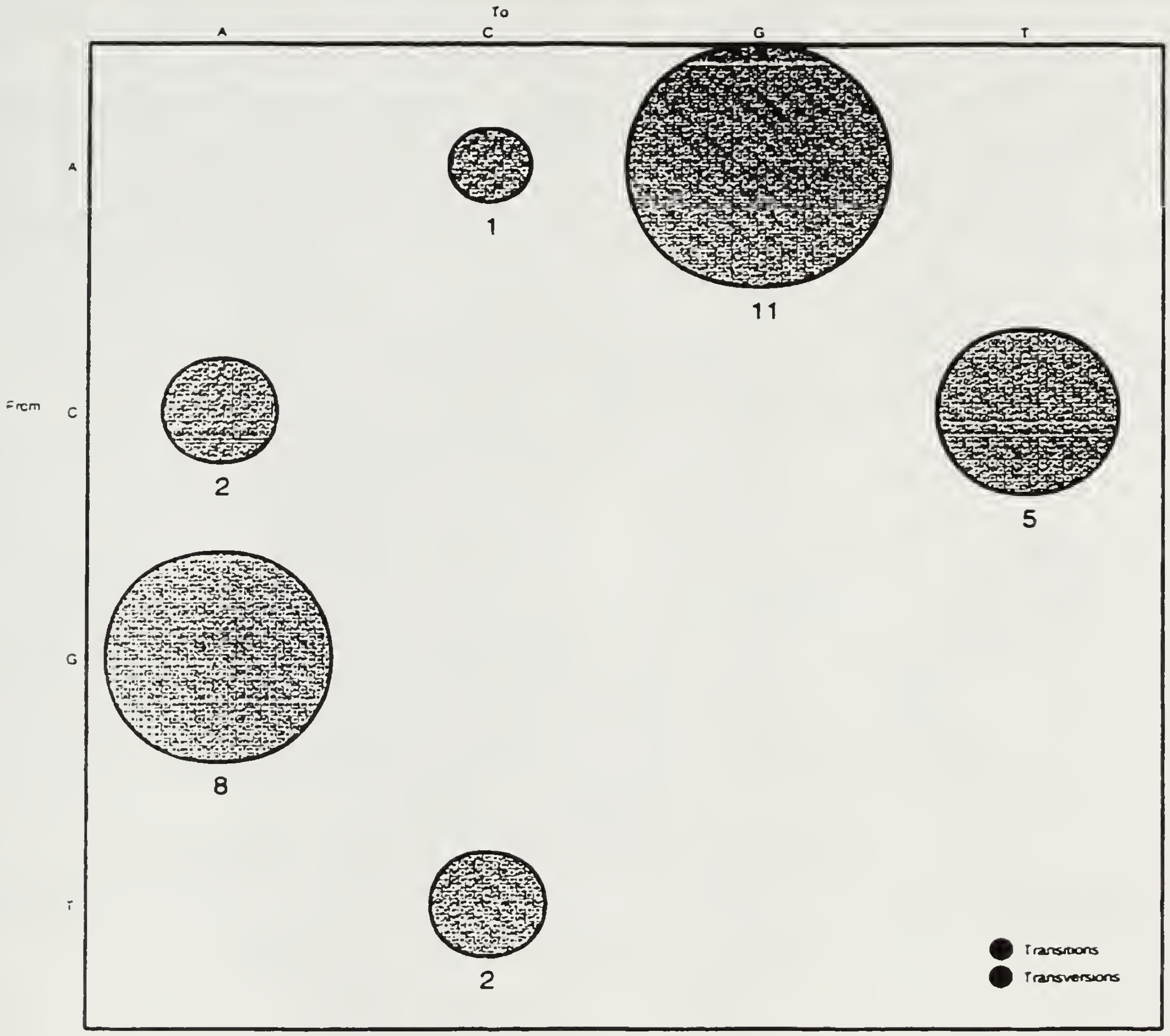

Figure 3-13. 5.8S Transitions/Transversions. Frequency of unambiguous changes between states in the 5.8S gene.

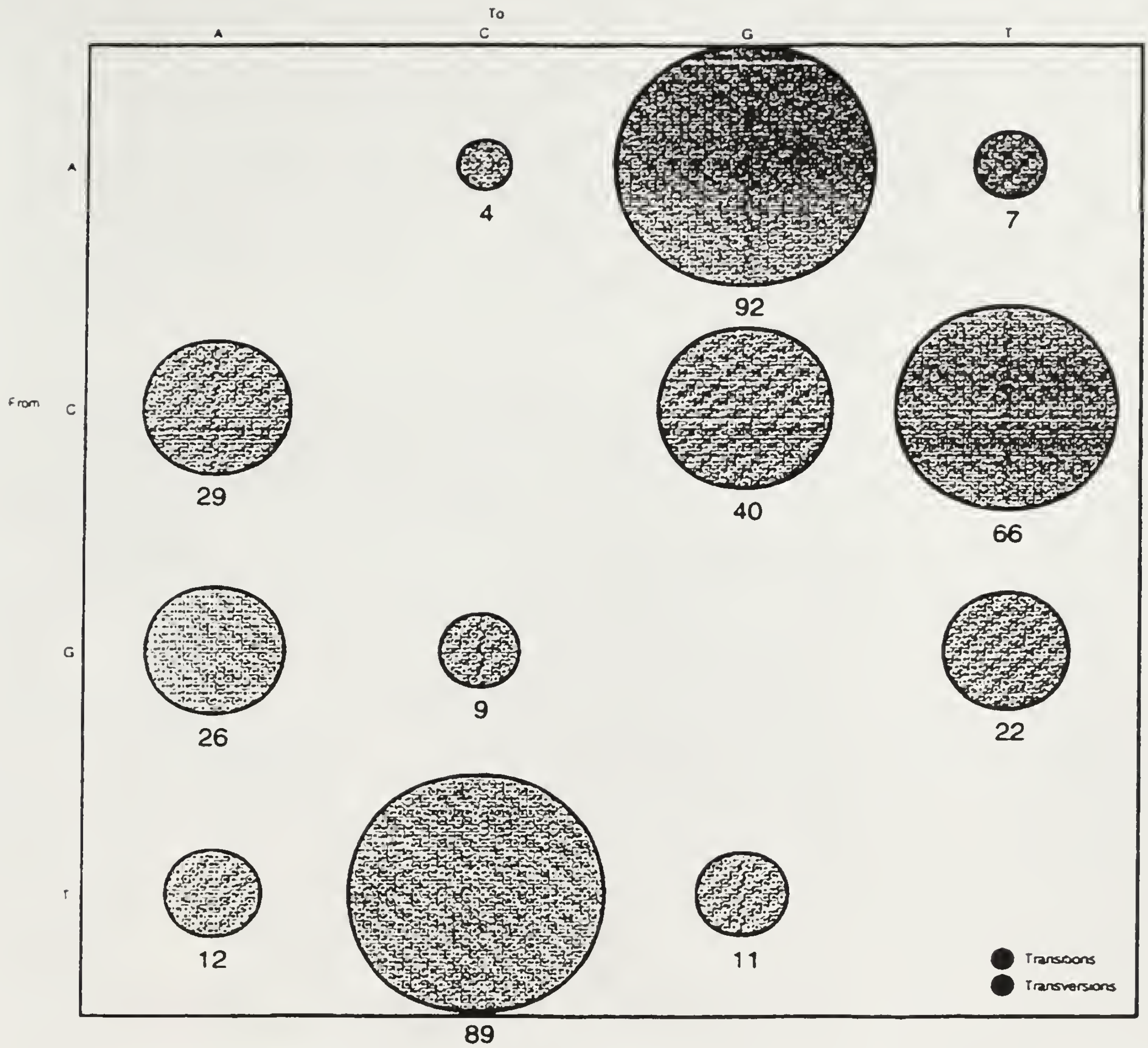

Figure 3-14. ITS 2 Transitions/Transversions. Frequency of unambiguous changes between states in the ITS 2 region.

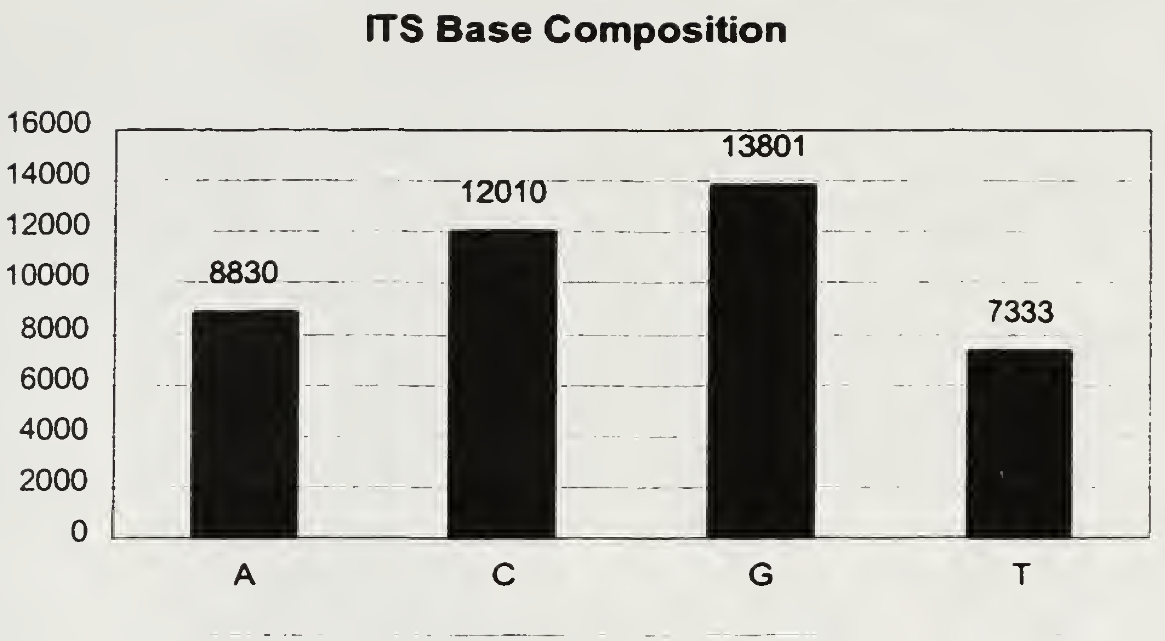

Figure 3-15. ITS base composition. The totals for the ITS matrix are indicated above each column.

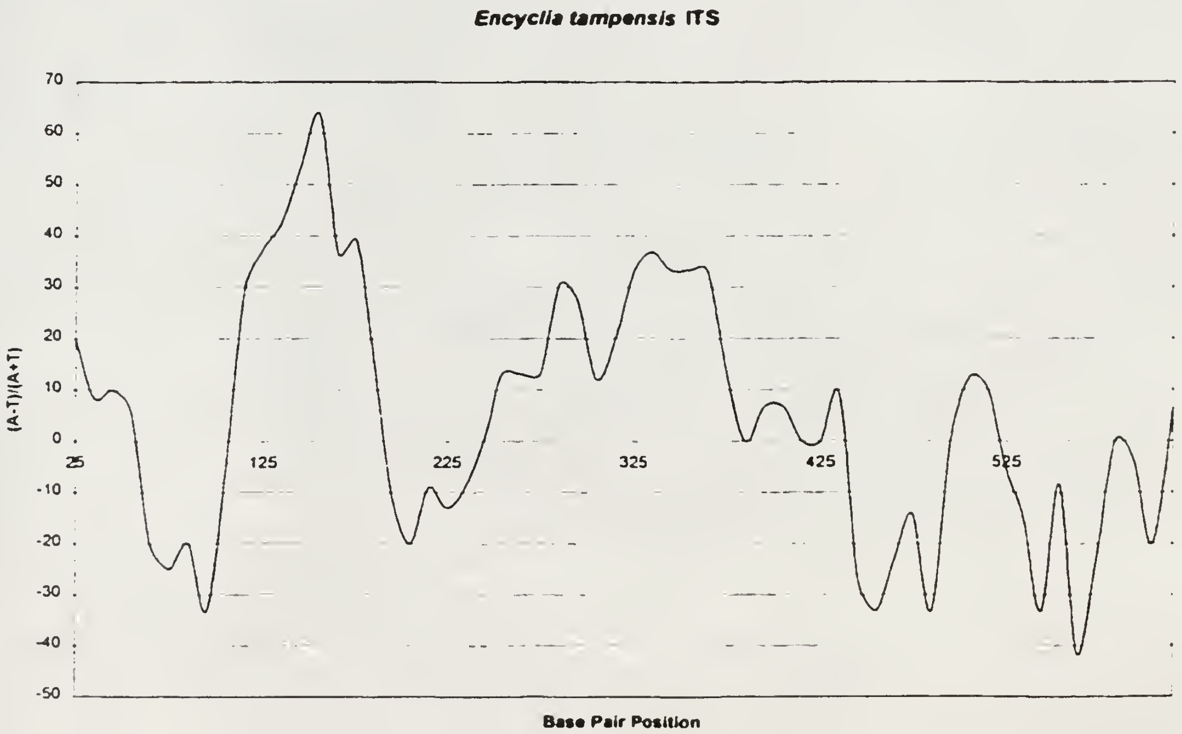

Figure 3-16. ITS AT Deviation. *Encyclia tampensis* was chosen to represent the genus in this analysis. The analysis used a window size of 50 bp and a step of 10 bp.

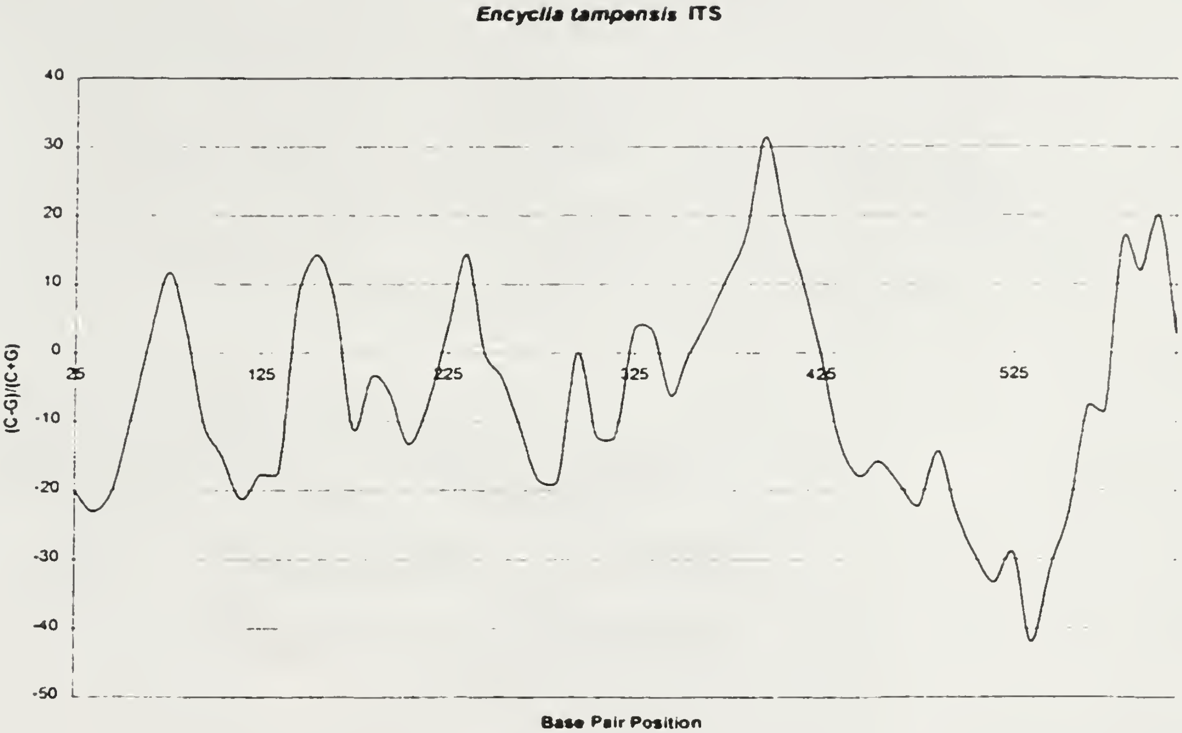

Figure 3-17. ITS CG Deviation. *Encyclia tampensis* was chosen to represent the genus in this analysis. The analysis used a window size of 50 bp and a step of 10 bp.

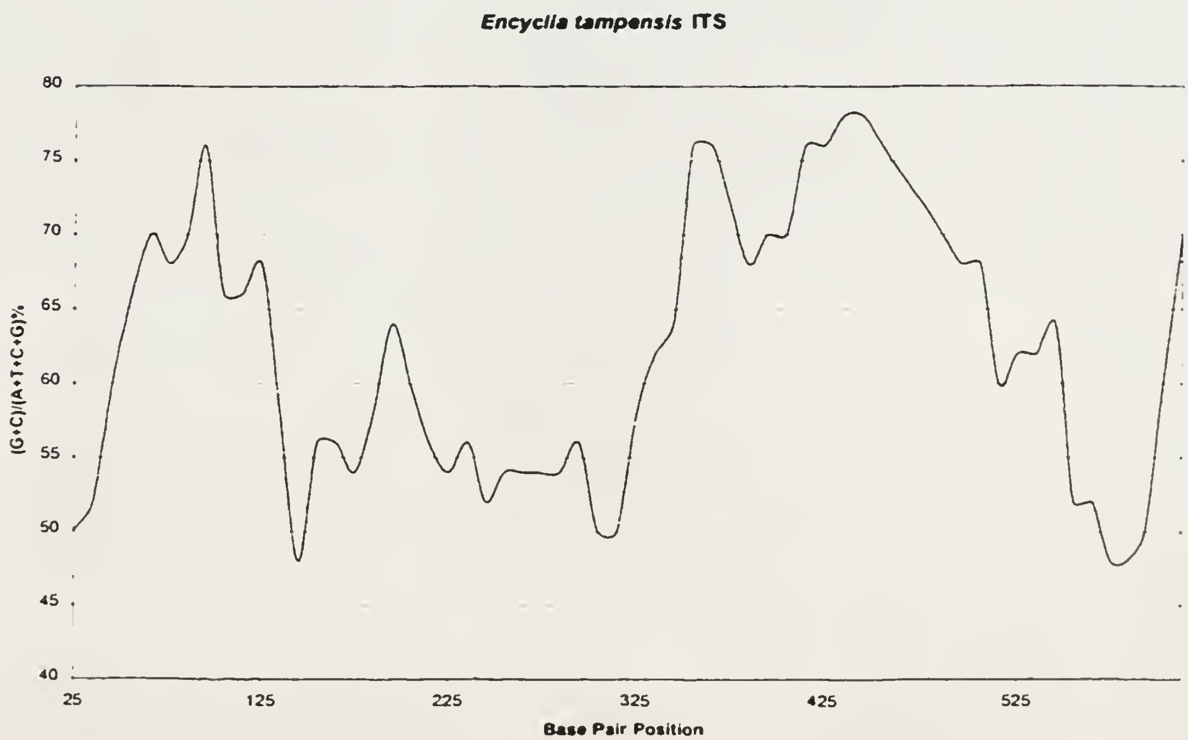

Figure 3-18. ITS GC Content. *Encyclia tampensis* was chosen to represent the genus in this analysis. The analysis used a window size of 50 bp and a step of 10 bp.

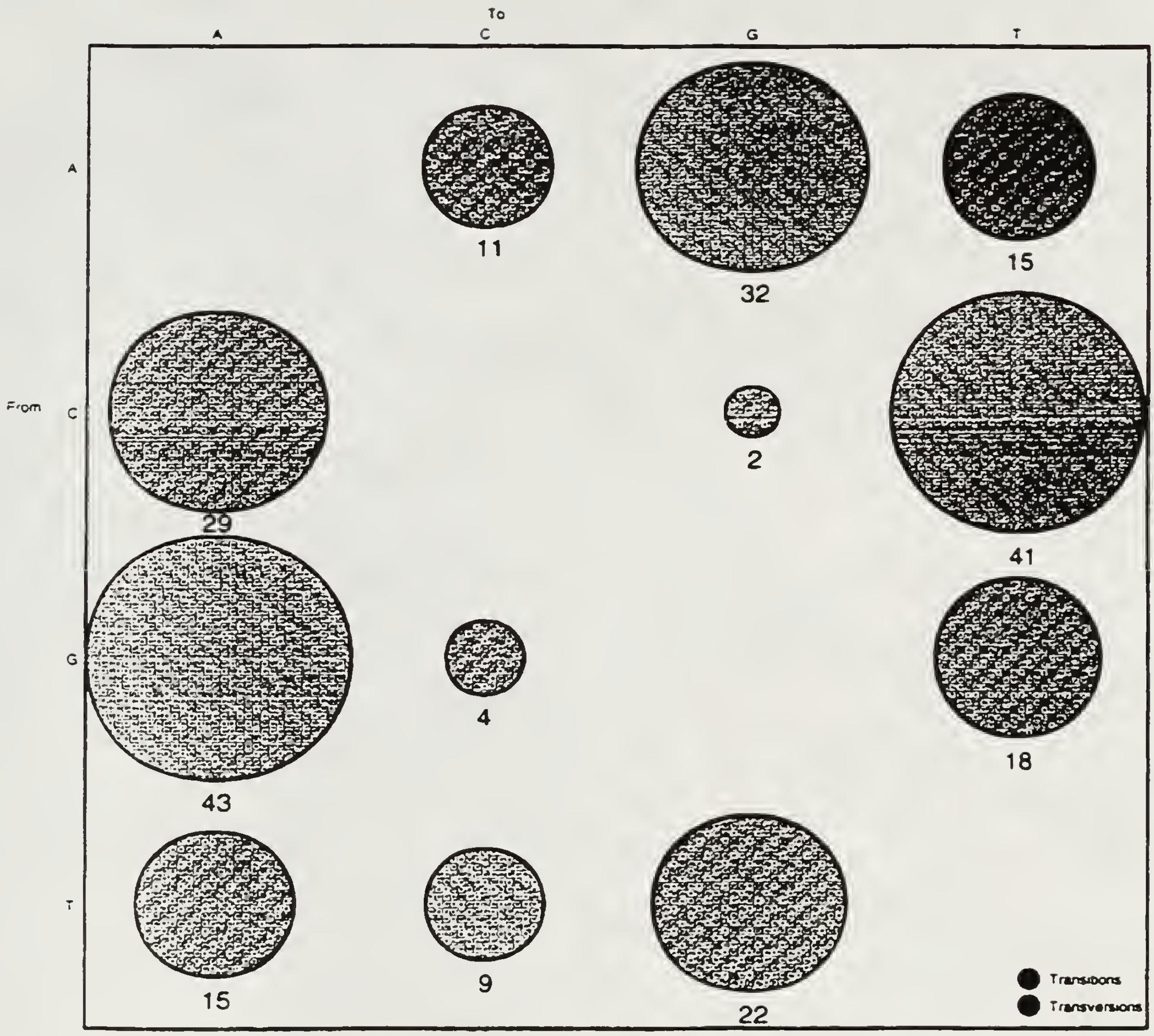

Figure 3-19. *trnL* Intron Transitions/Transversions. Frequency of unambiguous changes between states in the *trnL* Intron.

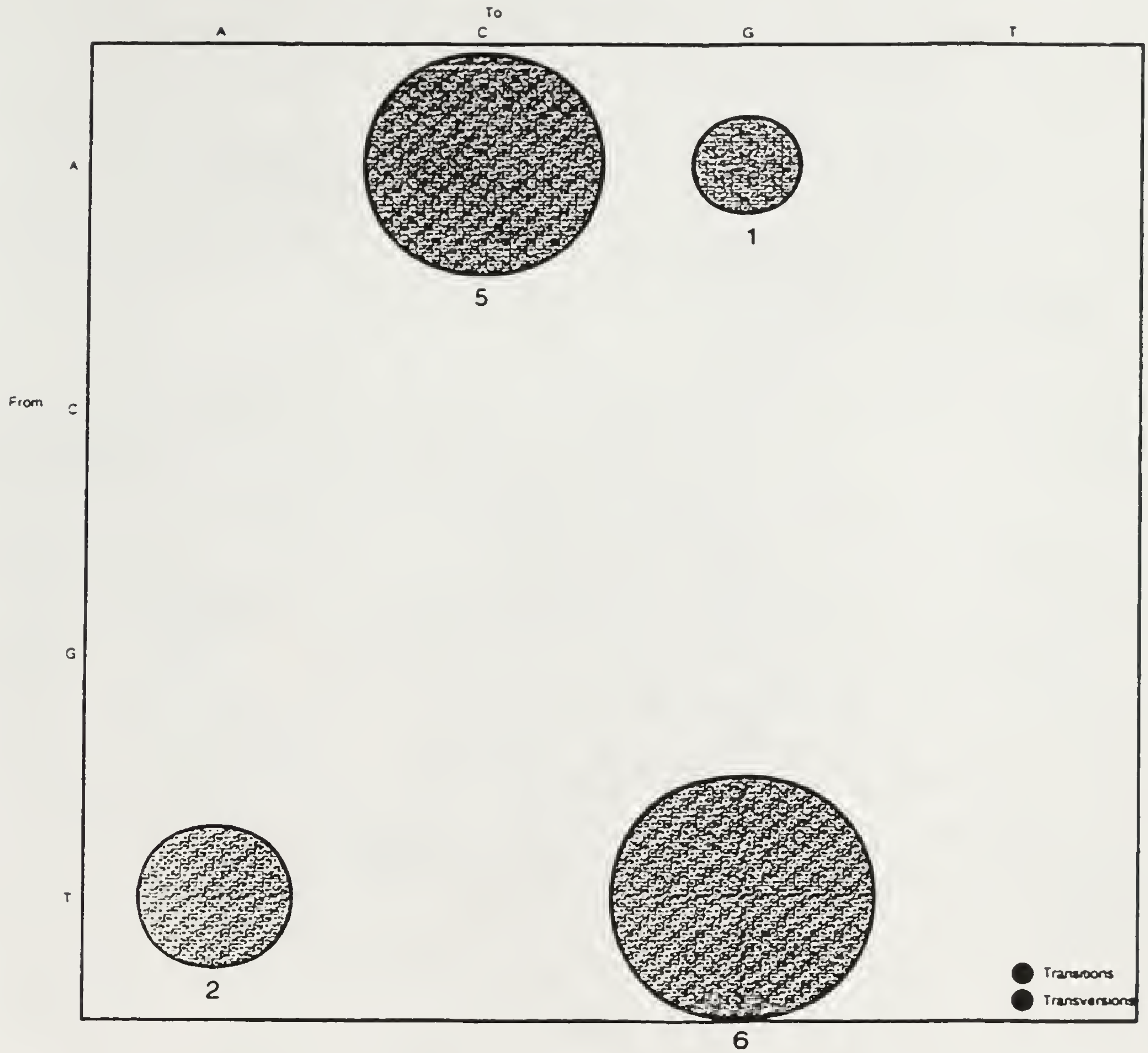

Figure 3-20. *trnL* Exon Transitions/Transversions. Frequency of unambiguous changes between states in the *trnL* exon.

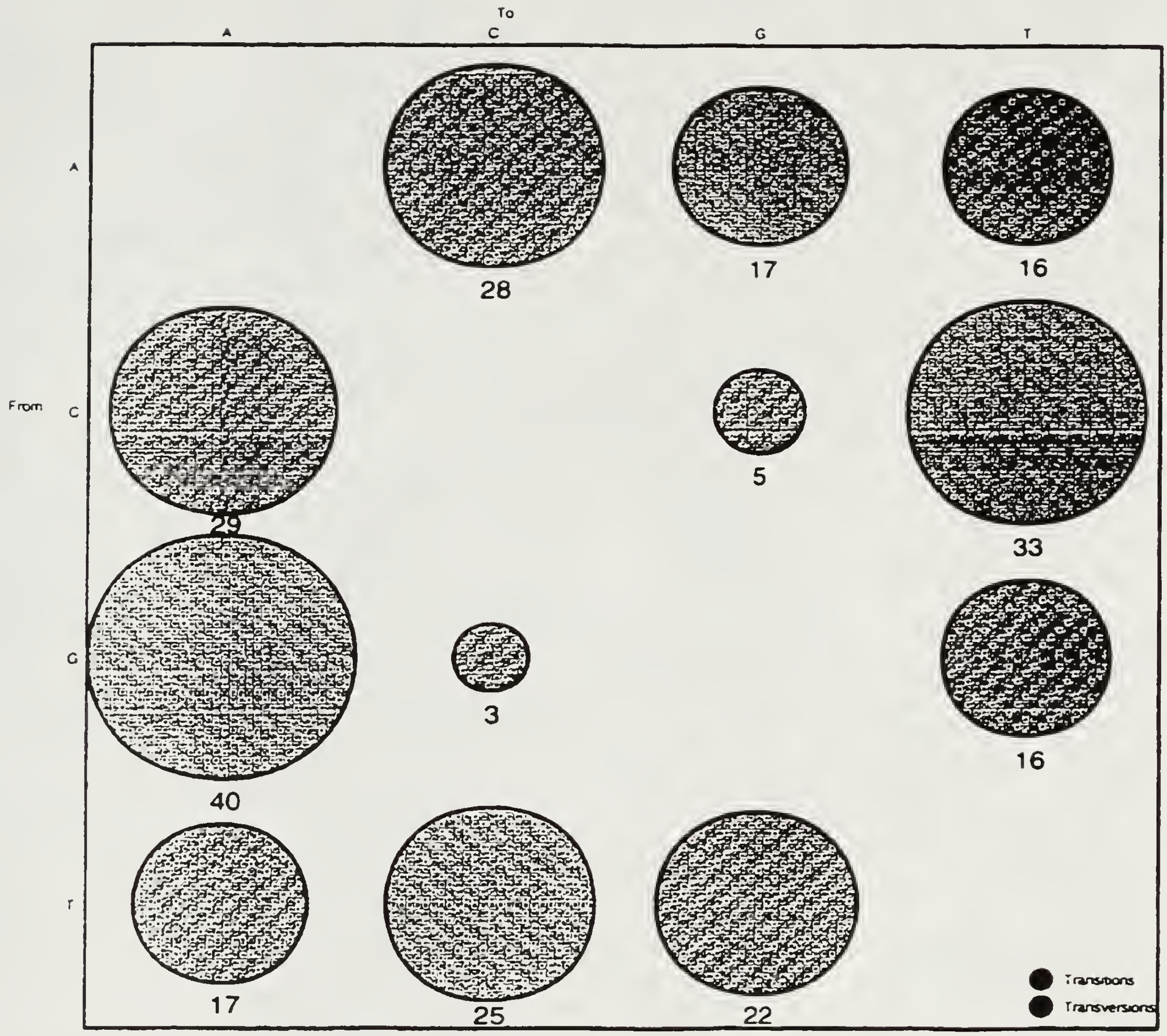

Figure 3-21. *trnL* Spacer Transitions/Transversions. Frequency of unambiguous changes between states in the *trnL* spacer.

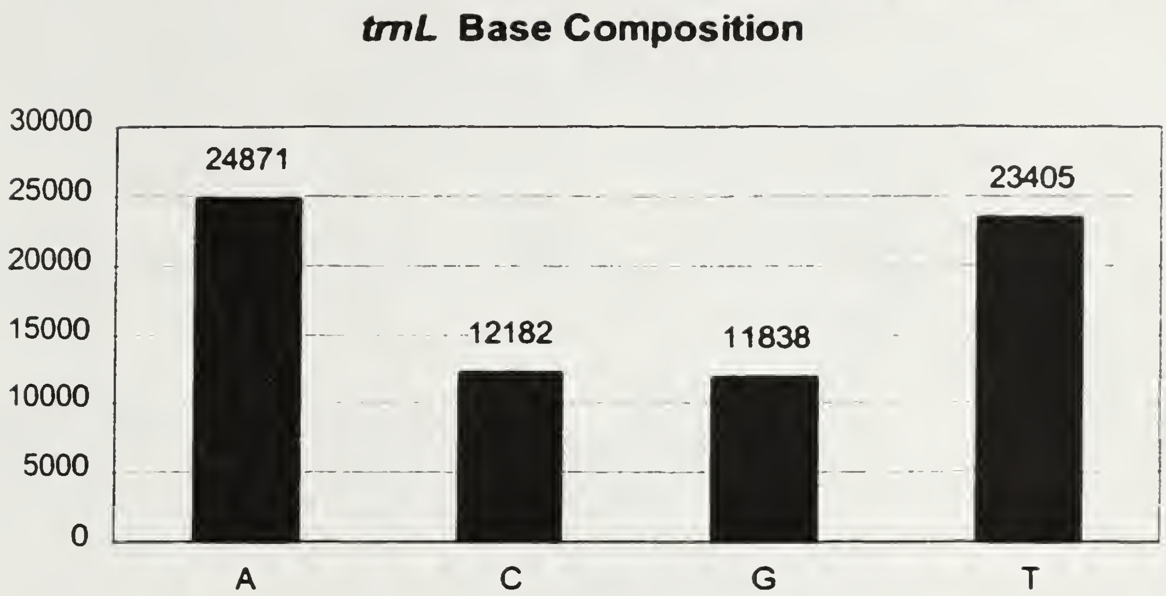

Figure 3-22. *trnL* Base Composition. The totals for the *trnL* matrix are indicated above each column.

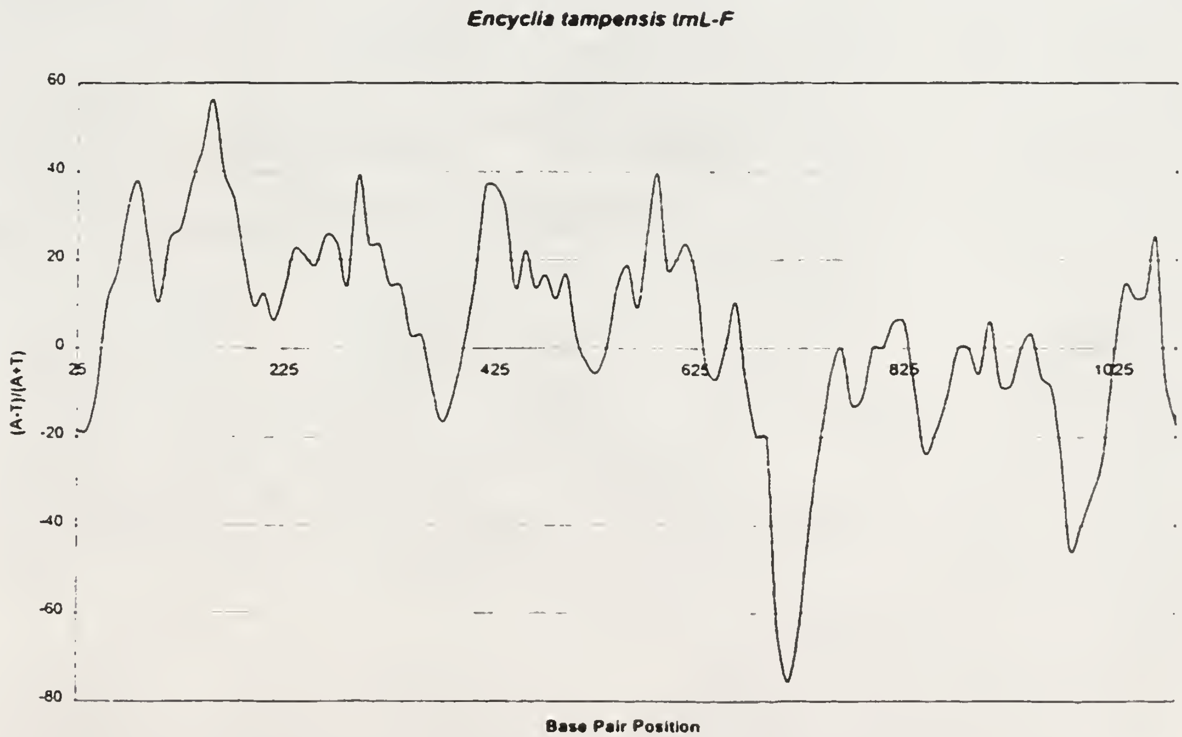

Figure 3-23. *trnL* AT Deviation. *Encyclia tampensis* was chosen to represent the genus in this analysis. The analysis used a window size of 50 bp and a step of 10 bp.

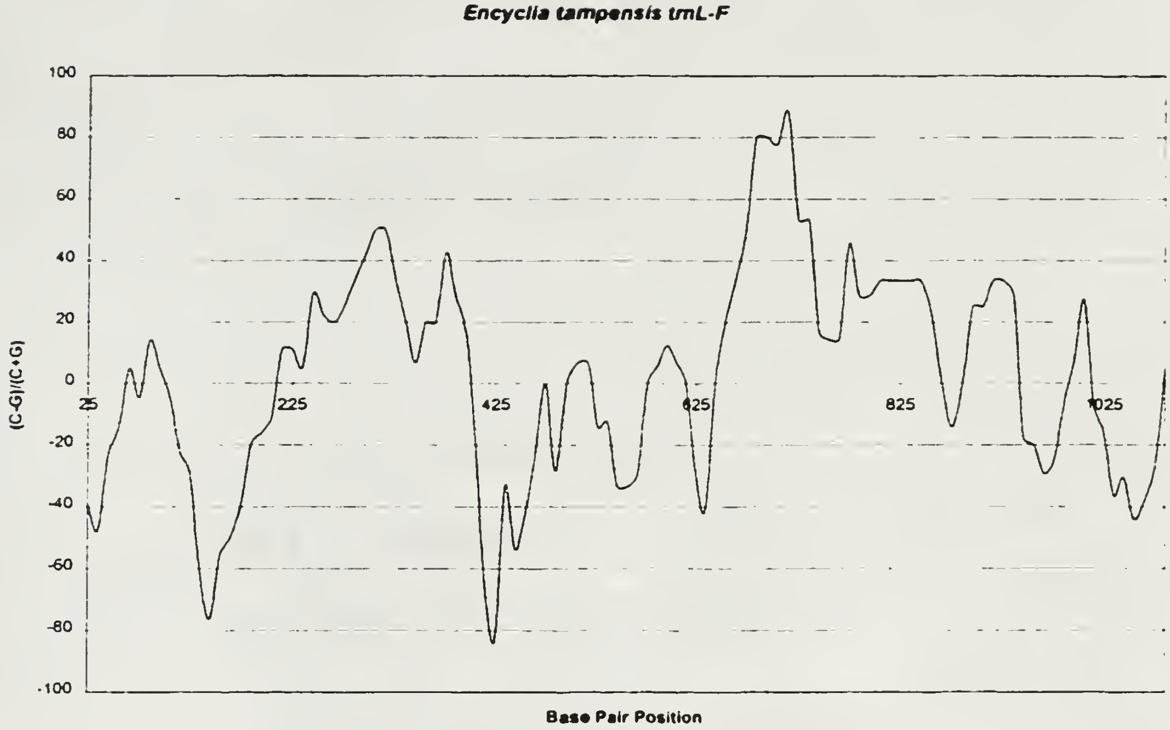

Figure 3-24. *trnL* CG Deviation. *Encyclia tampensis* was chosen to represent the genus in this analysis. The analysis used a window size of 50 bp and a step of 10 bp.

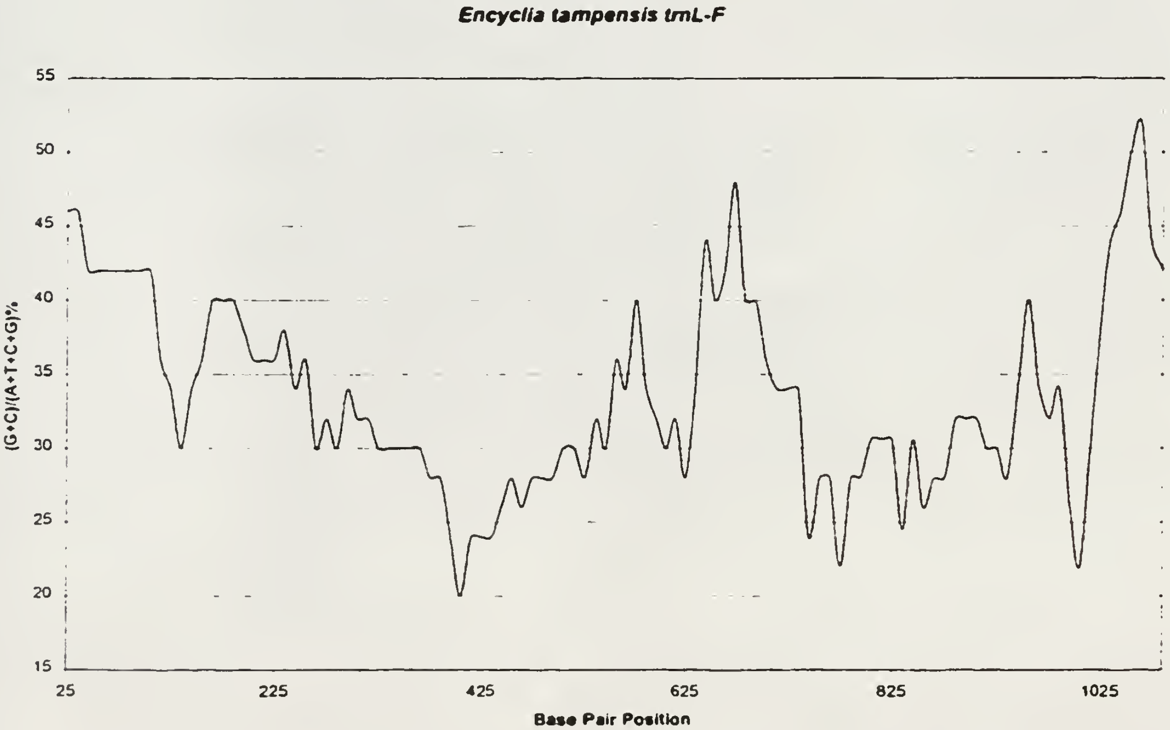

Figure 3-25. *trnL* GC Content. *Encyclia tampensis* was chosen to represent the genus in this analysis. The analysis used a window size of 50 bp and a step of 10 bp.

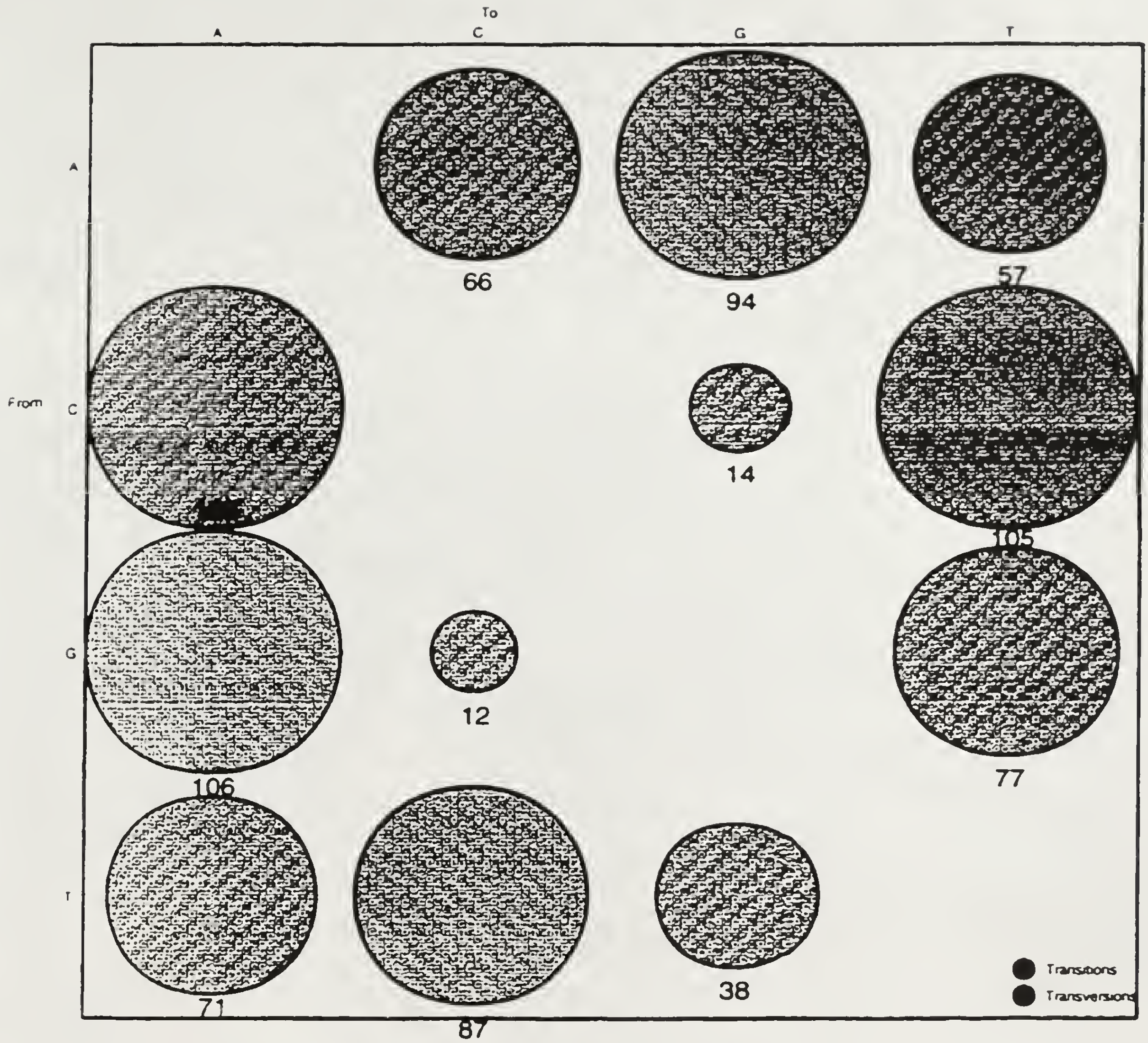

Figure 3-26. *matK* Transitions/Transversions. Frequency of unambiguous changes between states in the *matK* gene.

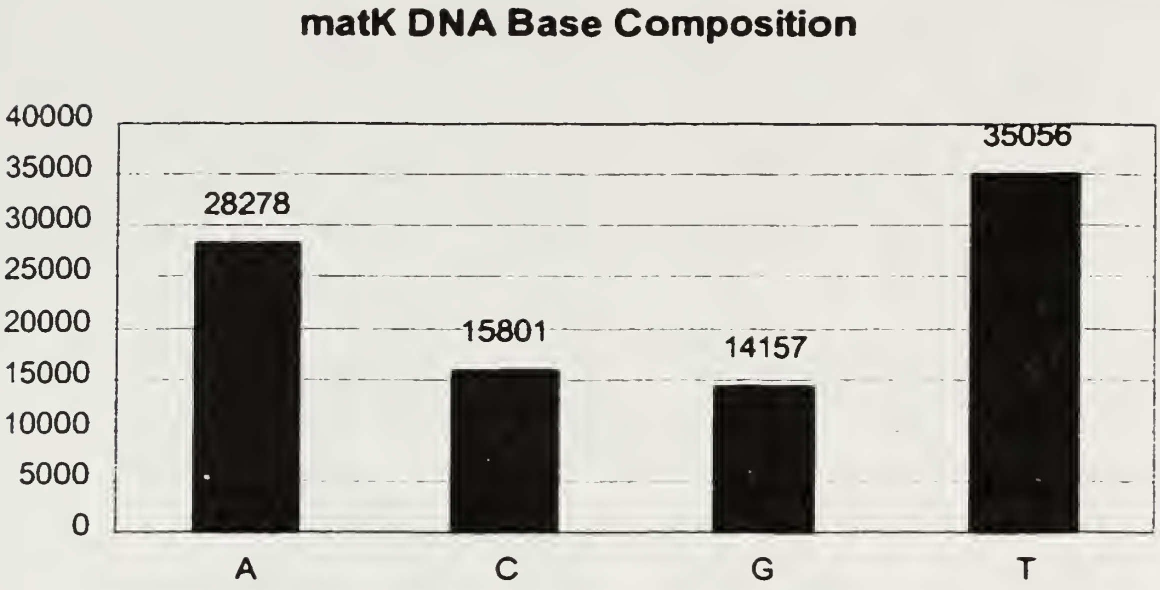

Figure 3-27. *matK* Base Composition. The totals for the *matK* matrix are indicated above each column.

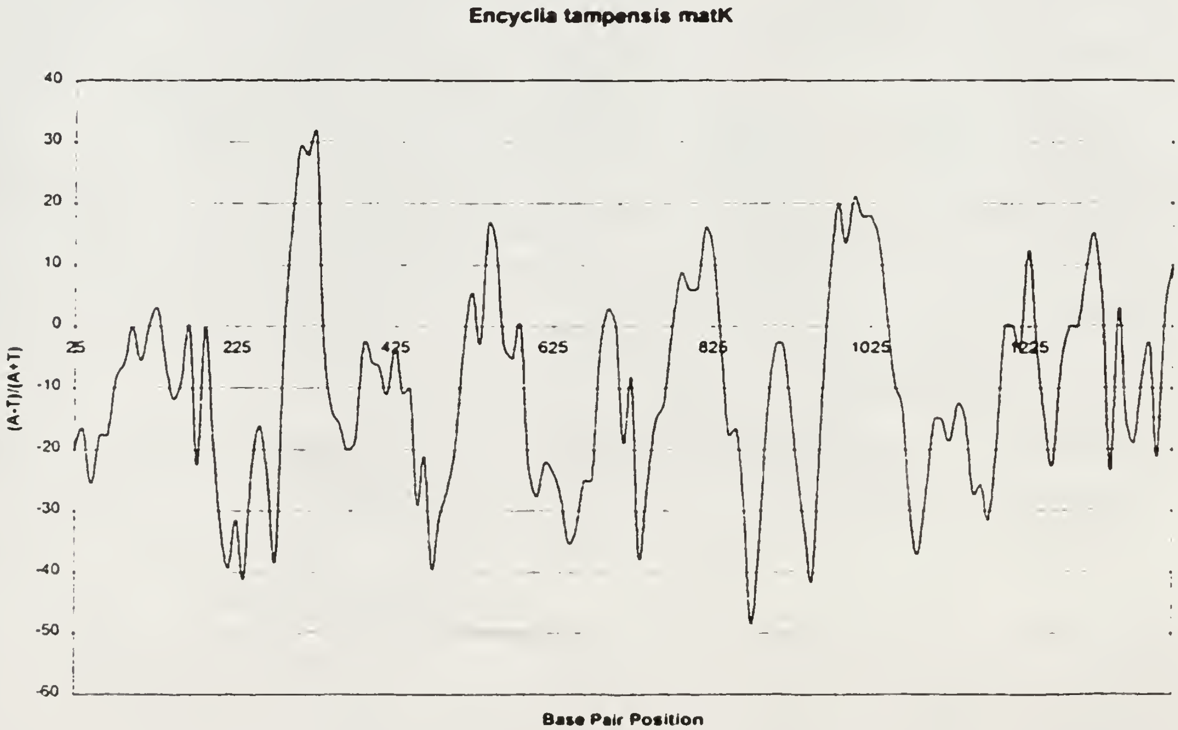

Figure 3-28. *matK* AT Deviation. *Encyclia tampensis* was chosen to represent the genus in this analysis. The analysis used a window size of 50 bp and a step of 10 bp.

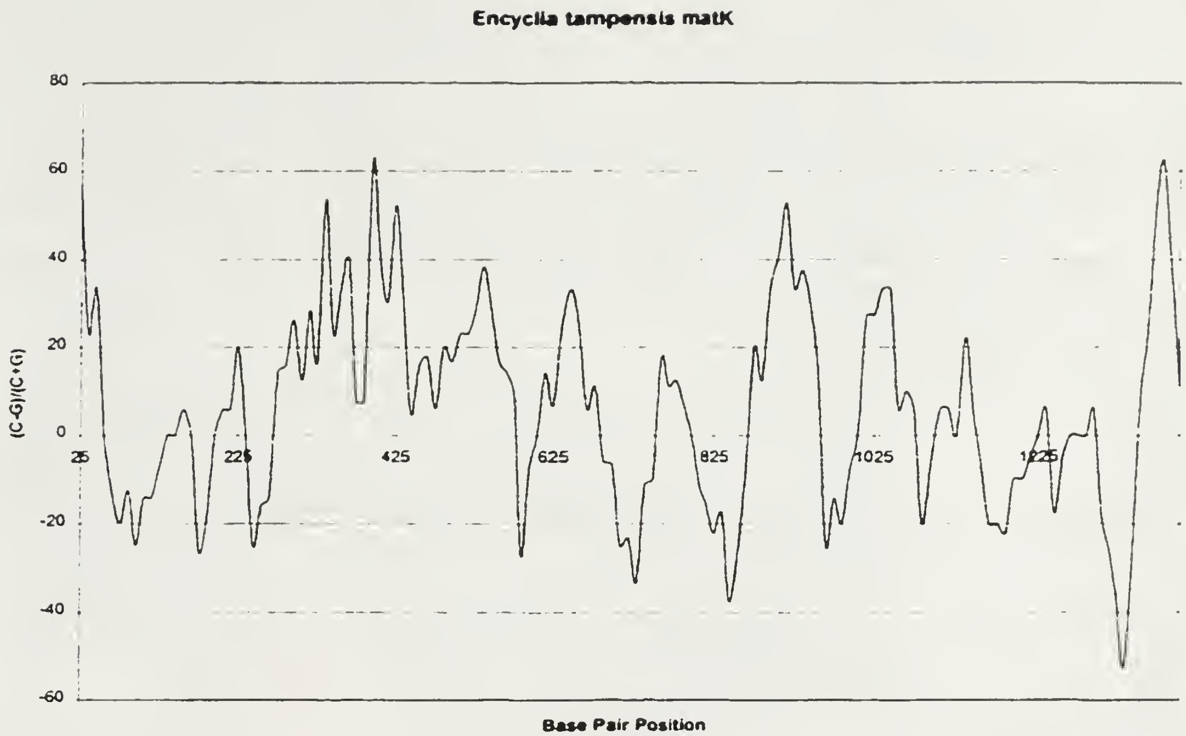

Figure 3-29. *matK* CG Deviation. *Encyclia tampensis* was chosen to represent the genus in this analysis. The analysis used a window size of 50 bp and a step of 10 bp.

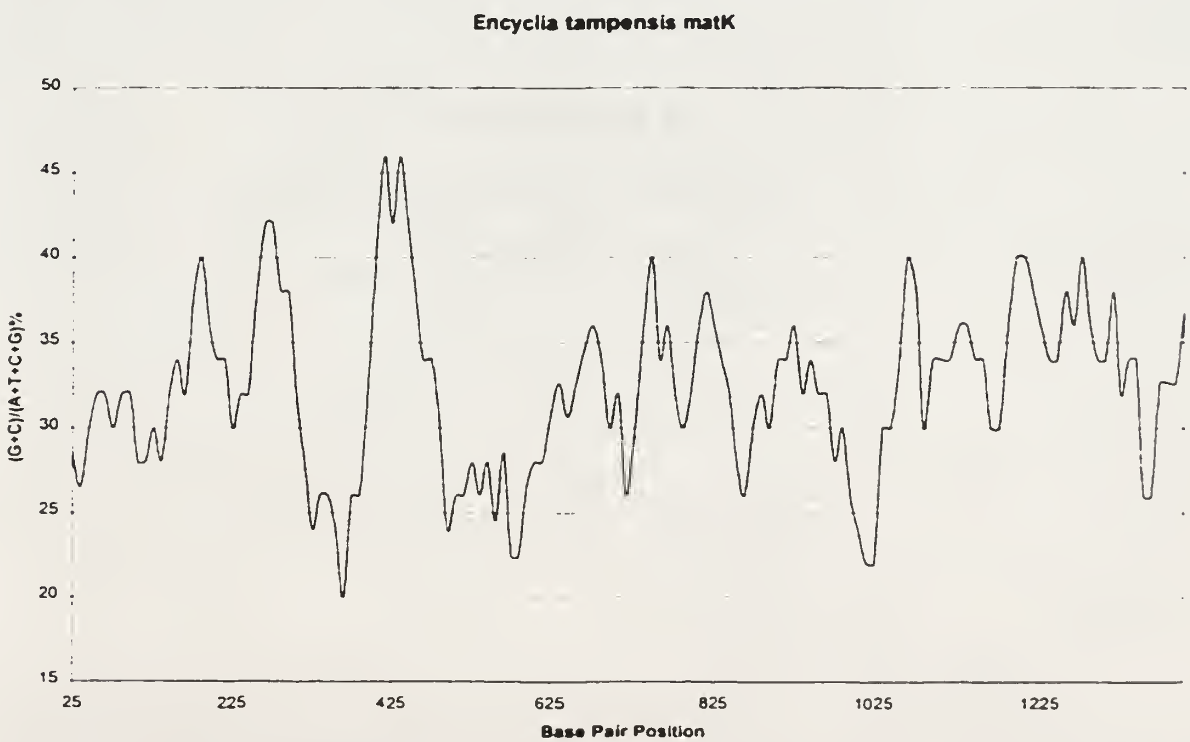

Figure 3-30. *matK* GC Content. *Encyclia tampensis* was chosen to represent the genus in this analysis. The analysis used a window size of 50 bp and a step of 10 bp.

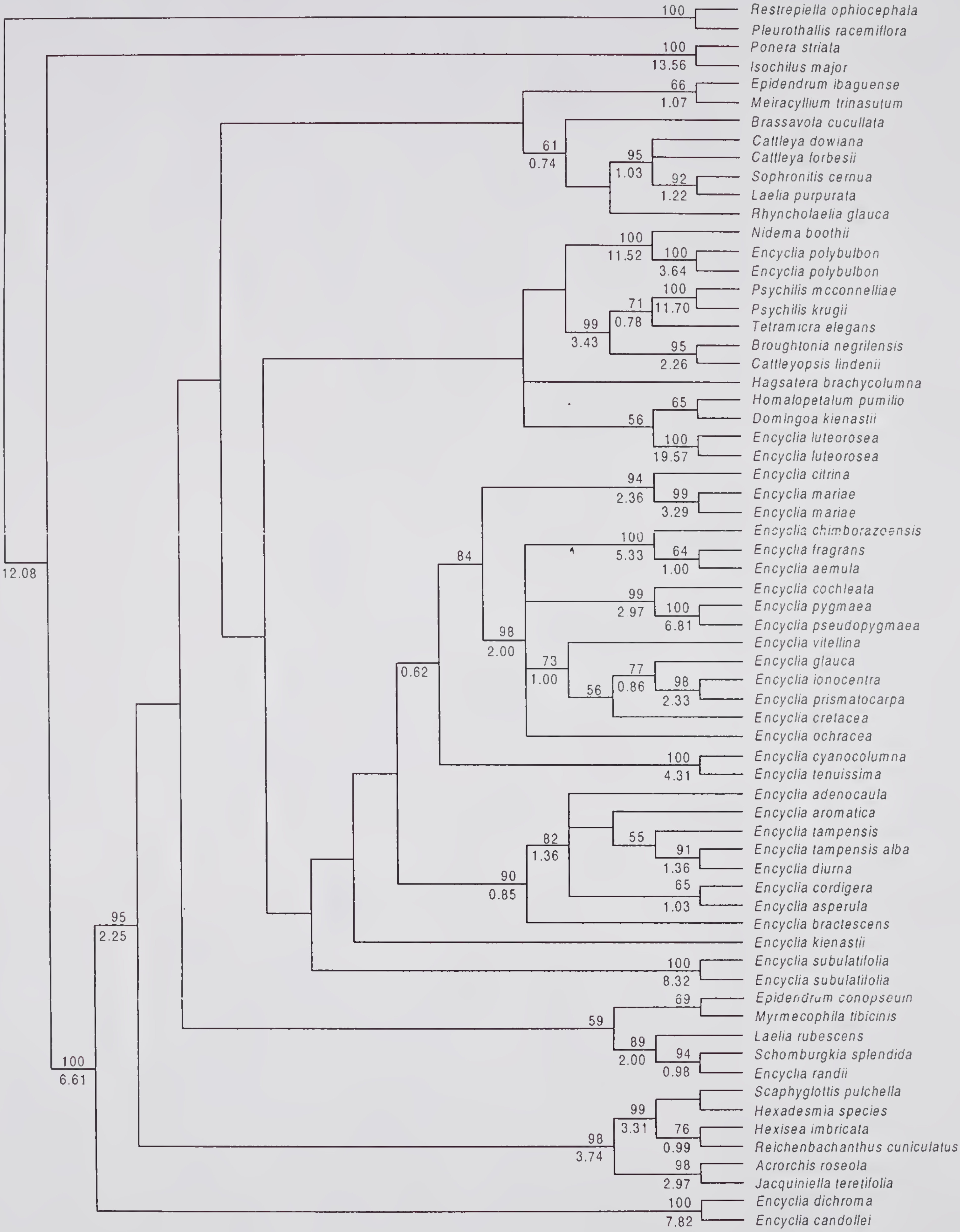

Figure 3-31. Weighted plastid sequences (*trnL-F* & *matK*) strict consensus tree for 10 equally parsimonious trees of 1521 steps with the following statistics: RI = 0.936, CI = 0.878, and RC = 0.822. Bootstrap percentages greater than 50 percent are given above the line. Decay indices greater than 0.5 steps are indicated below the line.

CHAPTER 4
COMBINED ANALYSES

Introduction

Biologists recognize that different traits evolve under different constraints (Huelsenbeck, et al., 1996). This is also true for different regions of DNA. Thus, a combined analysis will contain partitions that evolve separately. This may result in inconsistent estimates of the organism's phylogeny. This heterogeneity can be accommodated in three ways: a total evidence analysis, separate analyses, or conditional combination approaches. The total evidence approach for phylogenetic analysis was proposed by Kluge (1989). Miyamoto and Fitch (1995) argued that the partitions should be analyzed separately and the results combined using taxonomic congruence. Bull (1993) proposed that the data should only be combined if the trees from separate partitions were not significantly different. Although concerns have been raised about incongruent data partitions (Bremer, 1990), discordances among characters are useful in studying the evolution of organisms (Doyle, 1993).

During phylogenetic reconstruction, the influence of different evolutionary processes must be considered (Donoghue and Sanderson, 1998). Unique topologies are sometimes found when combining matrices. A combined analysis increases the number of characters which is known to increase the support (Bremer, et al., 1999). Combined analysis provide an improved resolution with higher support (Kron and Judd, 1997; Kron, et al., 1999). The total evidence approach was selected for this study as

being the best method to estimate the phylogeny. Combined analyses of morphological and molecular data examining the cladistic relationships of the slipper orchids (Cypripedioideae) have been published (Albert, 1994).

Matrix Methods

The individual DNA matrices were combined into one matrix for the combined DNA analysis. The data from one matrix was pasted into the other matrix below the existing taxa. The INTERLEAVE command was added so PAUP would correctly interpret the sequences and the total number of characters was adjusted. One caution in this process is that the taxa must be in the same order in both matrices. The combined DNA matrix is located in Appendix G.

The holomorphology matrix was constructed using the morphological matrix as the starting matrix. The DNA sequences were pasted into the matrix. The DATATYPE = DNA command was added to enable the DNA macros in PAUP (Table 4-1) that interpret ambiguity codes. The DNA base codes (A,T,C,G) were added to the FORMAT SYMBOLS command and the number of characters was adjusted.

Table 4-1. PAUP "Equate" macros

Ambiguity code	Equivalency
R ==>	{AG}
Y ==>	{CT}
M ==>	{AC}
K ==>	{GT}
S ==>	{CG}
W ==>	{AT}
H ==>	{ACT}
B ==>	{CGT}
V ==>	{ACG}
D ==>	{AGT}
N ==>	{ACGT}

Combined Analyses

Both the combined DNA and holomorphology matrices were analyzed with the same PAUP parameters. Confidence in tree topology was measured using bootstrap and decay analyses. The combined matrices were analyzed using both equal-weighted and weighted characters. The weighted values were determined by successive weighting based on the RC value. The individual character weights are listed in Appendix H.

Parsimony Analyses

A parsimony analysis was conducted using PAUP* 4.0. The settings for heuristic searches were: 1000 replicates, generating the starting trees by random stepwise addition, TBR branch swapping, saving MULTREES but no more than 10 trees per replicate less than or equal to the shortest tree. Gaps in the matrix were treated as "missing". The trees from the first search were then swapped to completion.

Bootstrap Analyses

The bootstrap analysis replaced 50% of the characters with character states randomly selected from the matrix. Each of the 1000 replicates of random replacement was followed by a heuristic search of 10 repetitions holding 10 trees per repetition. The branch-swapping algorithm was the nearest-neighbor interchange (NNI). A bootstrap analysis produces a consensus tree that indicates the percentage that the clades were present after each round of replacement and swapping.

Decay Analyses

The decay analysis was run for 100 replicates for each of the constraint trees generated by AutoDecay using the HSEARCH parameters: ADDSEQ=random, NREPS=100, RSEED=1, NCHUCK=10, and CHUCKSCORE=222. Note that the CHUCKSCORE can be any number less than the shortest tree.

Combined Results

When PAUP begins an analysis it calculates the total number of characters, the number of constant characters, the number of variable characters that are uninformative and the number of parsimony-informative characters (Table 4-2).

Table 4-2 Combined Character Status.

	DNA Combined	**Holomorphology**
Total Characters	3886	3999
Constant	2671	2681
Uninformative	641	654
Informative	574	664
Steps	2543	3242

Combined DNA Results

The equal-weighted analysis of the combined DNA matrix produced 6520 equally parsimonious trees of 2541 steps. The trees statistics were CI = 0.586, RI = 0.576, and RC = 0.338. The strict consensus tree is illustrated in Figure 4-1. The combined weighted DNA analysis produced 27 trees with 2543 steps. The trees statistics were CI = 0.586, RI = 0.575, and RC = 0.337. The weighted strict consensus tree is illustrated in Figure 4-2 with bootstrap and decay indices. A randomly chosen individual tree is

presented in Figure 4-3 showing the branch lengths. The average ratio of transversions to transitions is Ts/Tv = 1.54.

The individual gene regions were mapped onto the combined DNA trees to compare the number of steps required for that topology. A comparison of the equal-weighted lengths is found in Table 4-3 and the weighted comparison in Table 4-4.

Table 4-3. Combined equal-weighted tree statistics.

Region	**Steps**	**Mapped**	**Difference**
matK	956	980	+2.45 %
trnL-F	713	719	+0.83 %
Indel	63	72	+12.5 %
ITS	957	990	+3.33 %
Overall	2692	2541	-5.61 %

Table 4-4. Combined weighted tree statistics.

Region	**Steps**	**Mapped**	**Difference**
matK	961	983	+2.24 %
trnL-F	711	718	+0.97 %
Indel	063	072	+12.5 %
ITS	961	990	+2.93 %
Overall	2696	2543	-5.68 %

Holomorphology Results

The equal-weighted analysis of the holomorphology matrix produced 40 equally parsimonious trees of 3237 steps. The trees statistics were CI = 0.515, RI = 0.570, and RC = 0.294. The strict consensus tree with bootstrap percentages and decay indices is illustrated in Figure 4-4 and a random individual tree showing branch lengths in Figure 4-5. The combined weighted holomorphology analysis produced 1 tree with 3242 steps. The tree statistics were CI = 0.514, RI = 0.569, and RC = 0.292. When uninformative characters were excluded the consistency index was CI = 0.3734. The weighted tree is illustrated in Figure 4-6 with bootstrap and decay indices and branch lengths are illustrated in Figure 4-7. The morphology and DNA matrices were mapped onto the

holomorphology tree to compare the number of steps required for that topology, Table 4-5. The average pairwise distance was 2.9323% and the patristic distance matrix is located in Appendix I.

Table 4-5. Mapped morphology and DNA matrices.

Partition	Steps	Mapped	Difference
Morphology	665	674	+1.34 %
DNA	2543	2568	+0.97 %

Combined Discussion

Both the combined DNA and the holomorphology analyses show *Encyclia sensu* Dressler to be polyphyletic. Congruence of data partitions provided the strongest evidence that a phylogenetic estimate was accurate (Swofford, 1991). The holomorphology analysis produces better bootstrap and decay support than the DNA analysis alone. In all analyses, the weighted trees were longer than the equal-weighted trees. This strongly suggest that the shortest trees were influenced by homoplasious characters (see Homoplasy Matrix, Appendix J). This was probably caused by the selection of characters in the morphology matrix and the gene regions selected for the DNA matrix. When the individual partitions were mapped on the combined tree it was possible to determine which partition was most accurate (Tables 4-3 and 4-4). The *trnL-F* region has the lowest difference (0.97%). Thus, *trnL-F* region considered alone most closely reflects the phylogeny of the subtribe. The ITS region was too variable and the *matK* variation had too little phylogenetic signal for this set of taxa. The large difference for the indel matrix is caused by the low number of characters. Although the mapped trees were longer than the individual partition trees, the overall sum of the individual tree lengths was longer than the combined tree (Tables 4-3 and 4-4). Mapping the

morphology and DNA partitions onto the holomorphological tree (Table 4-5) reveals that the DNA partition is closer to the final tree. Table 4-6 shows the percentage of informative character for each matrix. These percentages can be deceiving because "informative" characters may be homoplasious. Although homoplasy itself is not necessarily bad, the pattern of homoplasy among characters is important.

Table 4-6. Percentage of informative characters.

Region	Variable	Uninformative	Informative	Percentage
Morphology	82	1	81	99
ITS	319	115	204	64
matK	404	196	208	51
trnL-F	474	303	171	36
Indel	52	26	26	50

Tree Topology

The equal-weighted DNA analysis (Figure 4-1) resolves *Encyclia* sections *Osmophytum*, *Dinema*, *Euchile*, and most of *Encyclia* (all except *E. kienastii*). Section *Leptophyllum* is paraphyletic. In the weighted analysis (Figure 4-2), the resolution of the sections remains the same, however, resolution within the sections is improved. *Encyclia* section *Euchile* has 100 percent bootstrap support and is sister to section *Osmophytum,* which also has 100 percent bootstrap support. Section *Hormidium* is embedded in section *Osmophytum*. Section *Encyclia* (less *E. kienastii*) has 100% bootstrap support and is sister to sections *Euchile*, *Osmophytum*, and part of section *Leptophyllum*. Section *Dinema* has 100% bootstrap and is sister to *Nidema*. Decay indices for the sections ranged from 2.35-5.84 steps.

The equal-weighted holomorphology analysis (Figure 4-4) produced a topology very similar to the DNA analysis. The main difference was *Encyclia* section *Leptophyllum*. *Encyclia luteorosea*, *E. cyanocolumna*, and *E. tenuissima* now group together with bootstrap and decay support. *Encyclia subulatifolia* is sister to the

Epidendrum clade. The weighted analysis (Figure 4-6) has improved resolution at the midpoint of the tree and increased support values. These support values are given in Table 4-7. However, recall that *E. kienastii* is not included in section *Encyclia* and that *E. subulatifolia* is excluded from section *Leptophyllum*. The most significant finding is that *Encyclia sensu* Dressler is not monophyletic. There are two other areas of interest in the final holomorphological tree. *Meiracyllium trinasutum*, a member of Meiracylliinae in Dressler's 1993 classification, is embedded in Laeliinae, and *Laelia* is polyphyletic.

Table 4-7. Support for sections of *Encyclia*.

Section	Bootstrap	Decay steps
Encyclia	100 %	5.319
Leptophyllum	97 %	0.695
Dinema	100 %	5.439
Osmophytum	100 %	5.491
*Hormidium**	100 %	9.38
Euchile	100 %	6.985

*Embedded in section *Osmophytum*

Examination of the branch lengths in Figure 4-7 reveals that the longest branch (131 steps) connects the outgroup for the subtribe to the ingroup Laeliinae. This indicates that an appropriate outgroup was chosen for rooting the tree. Examination of the remaining branches reveals a balanced pattern of branch lengths. This suggests that the phenomena of long branch attraction is not present in the matrix (Felsenstein, 1978a).

Character Evolution

The molecular characters have not been mapped onto a tree since individual bases changes are of little unique interest. Table 4-8 lists the number and type of character support for each section of *Encyclia*. The morphological matrix was mapped onto the holomorphological tree to examine the evolution of morphological characters.

The nodes in Table 4-9 refer to the nodes of the final tree (Figure 4-8). The morphological synapomorphies for *Encyclia* section *Encyclia* are flowers greater than 2.5 cm, column wings present, and column mid-tooth deltoid. The morphological synapomorphy for *Encyclia* section *Leptophyllum* is a smooth lip transition. The morphological synapomorphies for *Encyclia* section *Dinema* are a sessile inflorescence, column wings present, pollinia not attached, and two velamen layers. The morphological synapomorphies for *Encyclia* section *Osmophytum* including section Hormidium are the presence of flavonoid crystals, capsule suture strap, and column mid-tooth appendage. The morphological synapomorphies for *Encyclia* section *Hormidium* are a sessile inflorescence, absence of floral spathe, larger side-lobes than mid-lobe, side-lobes clasping the column, recurved lip mid-lobe, and sinewy root type. The morphological synapomorphies for *Encyclia* section *Euchile* are: flat leaf surface, flowers larger than 2.5 cm, nectary present, column mid-tooth truncate, column lateral teeth truncate, tubular lip, and tubular mid-lobe. The homoplasious nature of morphological characters is evident in that some of the sections have the same synapomorphies (flower size, column wings, sessile inflorescence, etc.) but each group has a unique combination.

Table 4-8. Number and type of character support for sections.

Section	**Node**	**Morphology**	**ITS**	***trnL-F***	***matK***	**Indel**
Encyclia	56	3	10	2	0	2
Leptophyllum	27	1	2	1	2	0
Dinema	7	4	6	2	6	0
Osmophytum	55	3	3	3	1	0
*Hormidium**	11	6	4	8	7	1
Euchile	29	7	14	3	4	0

*Embedded in section *Osmophytum*

Table 4-9. Unambiguous morphological changes.

Node	Character	Change
1	14	0 → 1
	18	1 → 0
	19	1 → 0
	56	0 → 1
	66	0 → 1
	79	0 → 1
2	15	1 → 2
	16	1 → 0
	17	1 → 0
	20	1 → 0
	22	1 → 3
	34	0 → 1
	54	0 → 1
	82	1 → 0
3	44	0 → 1
	54	1 → 0
	58	1 → 2
	69	4 → 5
	70	0 → 2
	78	6 → 1
4	17	1 → 2
	19	1 → 2
	45	0 → 1
	52	0 → 1
	73	0 → 1
	77	0 → 2
5	10	1 → 0
6	0	–
7	31	0 → 2
	45	0 → 1
	58	1 → 2
	80	1 → 0
8	70	2 → 1
	73	0 → 1
9	3	1 → 0
10	11	2 → 1
	26	3 → 2
11	31	0 → 2
	34	0 → 1
	74	0 → 1
	76	0/1 → 2
	77	0 → 2
	82	1 → 2
12	47	1 → 0
13	45	1 → 0
14	0	–
15	80	1 → 3
16	40	0 → 1
	47	1 → 2
	55	3 → 1
	68	1 → 2
	69	1 → 3
	76	0 → 1

Table 4-9—continued.

Node	Character	Change
17	5	1 → 0
	8	0 → 1
	12	1 → 0
	41	0 → 1
	70	2 → 0
	77	0 → 1
18	28	0 → 1
	38	1 → 0
	47	1 → 4
	48	0 → 1
	50	1 → 4
	51	0 → 1
	57	0 → 1
	73	1 → 0
19	55	3 → 1
	58	1 → 0
	78	3 → 7
20	68	1 → 0
21	0	–
22	3	1 → 0
	7	2 → 3
	12	1 → 0
	15	1 → 0
	22	1 → 0
	45	0 → 1
	51	0 → 1
23	7	2 → 0
	20	1 → 0
	34	0 → 1
	55	1 → 2
24	31	0 → 2
	61	1 → 0
25	15	1 → 0
	16	1 → 0
	22	1 → 3
	47	1 → 0
	72	0 → 1
26	1	1 → 0
	16	1 → 0
	23	1 → 0
27	73	0 → 1
28	5	0 → 1
	33	1 → 0
	82	1 → 2
29	19	0 → 1
	37	0 → 1
	41	0 → 1
	47	1 → 0
	50	2 → 0
	71	0 → 1
	77	0 → 1
30	33	1 → 0

Table 4-9—continued.

Node	Character	Change
31	8	0 → 1
	50	2 → 1
32	0	–
33	0	–
34	73	1 → 0
35	29	2 → 0
	76	0 → 3
	77	0 → 1
36	50	1 → 2
	68	1 → 0
	76	0 → 2
37	5	1 → 2
38	2	1 → 0
39	6	0 → 1
	8	0 → 1
	38	0 → 1
	50	4 → 1
	70	2 → 0
	77	0 → 3
40	0	–
41	21	0 → 1
42	7	2 → 0
	30	1 → 0
	36	1 → 0
	41	0 → 1
43	80	1 → 2
44	19	0 → 1
	53	0 → 1
	60	2 → 0
	61	1 → 0
	69	2 → 4
	78	2 → 6
45	3	0 → 1
	12	0 → 1
	18	0 → 1
	37	0 → 1
46	0	–
47	18	0 → 1
	78	0 → 3
48	70	2 → 0
49	50	2 → 4
50	0	–
51	68	2 → 1

Table 4-9—continued.

Node	Character	Change
52	5	0 → 1
	11	3 → 2
	26	2 → 3
53	11	3 → 4
	31	0 → 1
54	29	0 → 2
	30	0 → 1
	37	0 → 1
	55	1 → 3
	78	2 → 0
55	24	0 → 1
	27	0 → 1
	46	0 → 1
56	37	0 → 1
	45	0 → 1
	47	1 → 2
57	25	0 → 1
	26	0 → 2
	48	0 → 1
	52	0 → 1
58	3	1 → 0
59	5	1 → 0
	7	2 → 0
	11	0 → 3
	12	1 → 0
60	50	1 → 2
	73	1 → 0
61	23	0 → 1
	26	1 → 0
	36	0 → 1
	41	1 → 0
	42	1 → 0
	68	0 → 2
	72	0 → 1
62	1	0 → 1
63	61	0 → 1
64	14	1 → 0
	18	0 → 1
	19	0 → 1
	56	1 → 0
	66	1 → 0
	79	1 → 0

Note: Characters and states are listed in Table 2-1.

Molecular Evolution

Molecular evolution of genes was examined through patterns of mutation, not through individual base changes. A comparison of gene region variability is found in Table 4-10. The ITS region is most variable whereas *trnL-F* and *matK* have lesser but similar variability. Of the variable sites, ITS has the largest percentage of informative sites followed by *matK* and *trnL-F* respectively. The tree-based estimate of divergence is based on the number of character steps in the combined tree. ITS also has the highest average steps per site. The *matK* gene appears to be more divergent than *trnL-F*. However, these statistics are skewed by the large number of indels (49) in the *trnL-F* matrix. Indels can increase the number of sites in the matrix without increasing the number of steps. The variation in the ITS region occurs in the spacers and not in the coding 5.8S gene (Figure 4-9).

Table 4-10. Comparison of gene variability.

Matrix	**ITS**	***trnL-F***	***matK***
Positions	744	1680	1441
Variable sites	319	474	404
Percent variable	42.9	28.1	28.0
Informative sites	204	171	208
Percent informative	27.4	10.2	14.4
Average steps per site	1.33	0.43	0.68

In molecular evolution, the ratio of transitions to transversions reflects the types of mutations occurring. Transitions are more numerous than transversions in the ITS region, especially in the 5.8S coding region, while the ratio is neutral (near 1) in the *trnL* intron, *trnL* spacer, and *matK* (Table 4-11). The very low ratio for the *trnL* exon is most likely a statistical fluke caused by the very short length of the gene and its low mutation rate. The spacers in the ITS regions 1 & 2 have similar ts/tv ratios to each other but differ from the spacer in *trnL-F*. The evolutionary process in a nuclear gene family that is tandomly repeated must differ from the process in the circular chloroplast genome. The

nuclear rDNA regions are subject to recombination arising from the biparental genomes and changes in one copy of this repeated gene family are propagated to other copies though a mechanism know as concerted evolution. Since the circular plastid genome has uniparental inheritance, it is not subject to this type of recombination or evolution. The likelihood of transition is influenced by CG content (Mortan, 1995). Both *matK* and *trnL-F* regions are CG rich (Figures 3-27 & 3-22). The ts/tv ratio in *matK* is low compared to other angiosperms: Cornaceae, 1.21 (Xiang, et al., 1998); Apiaceae, 1.13 (Plunkett, et al., 1997). Examination of Figures 4-10 & 4-11 reveals that *trnL* and *matK* have similar patterns of variation. (Note: the flat portion of the graph around site 600 is caused by a large insertion in four taxa.) This pattern of *matK* variation for the entire region implies a relaxed selection of the gene toward neutral selection (Hilu and Liang, 1997). Although the three indels in the *matK* matrix occur in multiples of three bases, the patterns and preference of variation suggest that *matK* may be a pseudogene in orchids. However, the presence of *matK* in *Epifagus*, a parasitic plant that has lost 65 percent of its plastid genes, suggests that it is functionally significant in plants (Hilu and Liang, 1997).

Table 4-11. Transition/Transversion Ratios.

Region	**Ts/Tv Ratio**
5.8 S	8.67
ITS 2	2.22
ITS 1	2.15
trnL intron	1.08
matK	0.89
trnL spacer	0.85
trnL exon	0.08

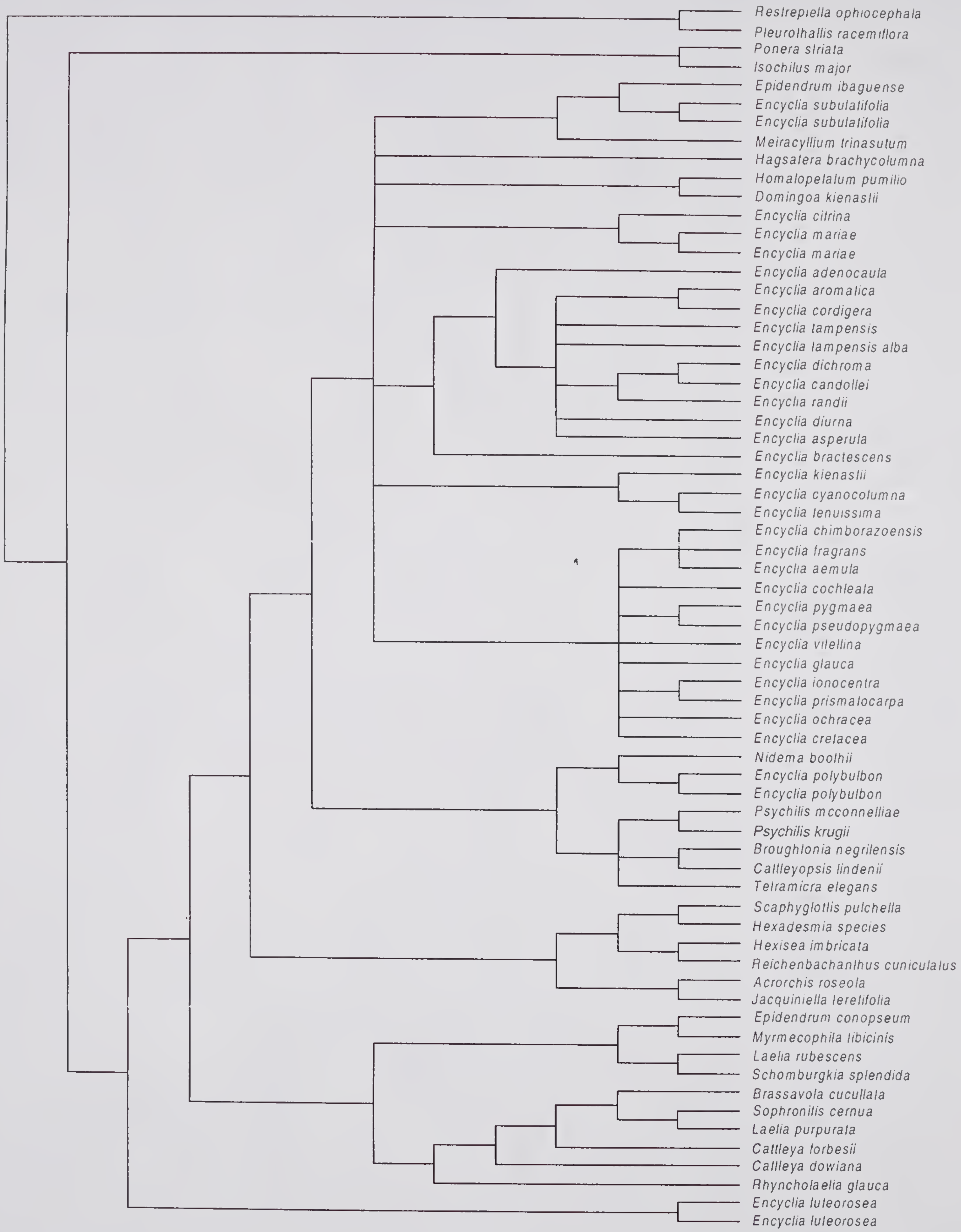

Figure 4-1. Equally weighted strict consensus tree for 6520 equally parsimonious trees of 2541 steps. The trees statistics are CI = 0.586, RI = 0.576, and RC = 0.338 for combined DNA matrix.

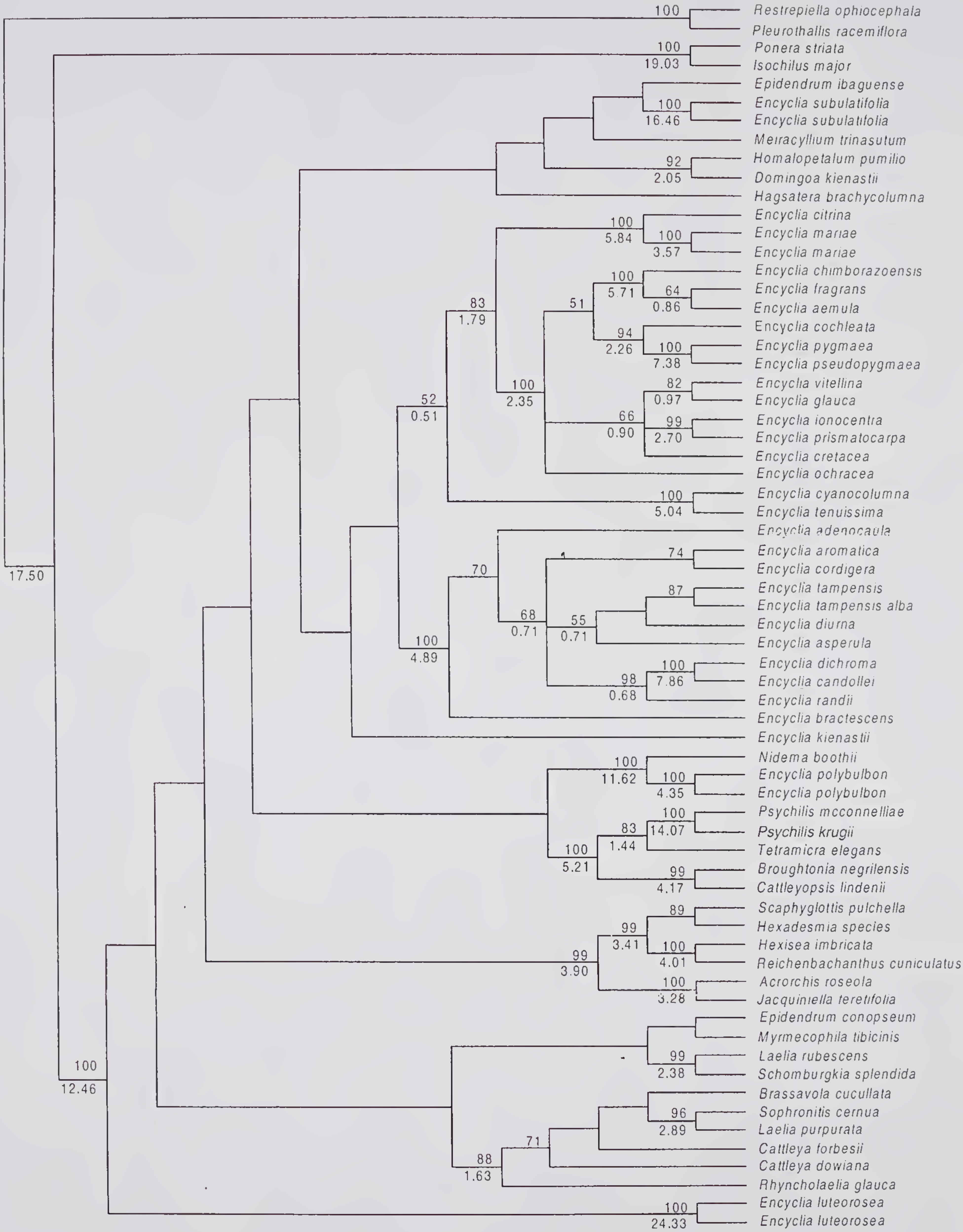

Figure 4-2. Weighted combined DNA strict consensus tree for 27 trees with 2543 steps. The trees statistics were CI = 0.586, RI = 0.575, and RC = 0.337. Bootstrap percentages greater than 50 percent are given above the line. Decay indices greater than 0.5 steps are indicated below the line.

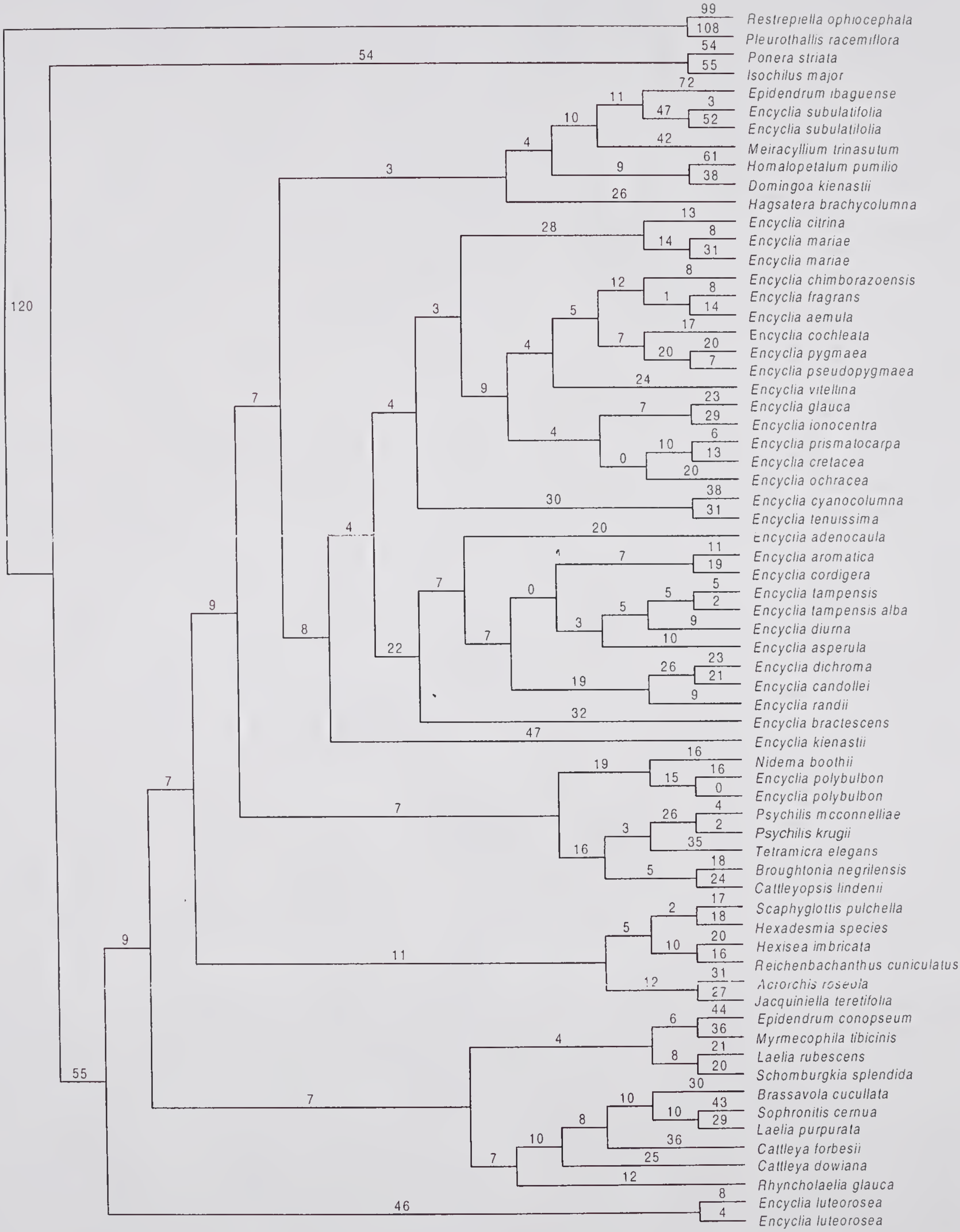

Figure 4-3. Randomly selected tree for weighted combined DNA. The branch lengths are indicated in number of steps.

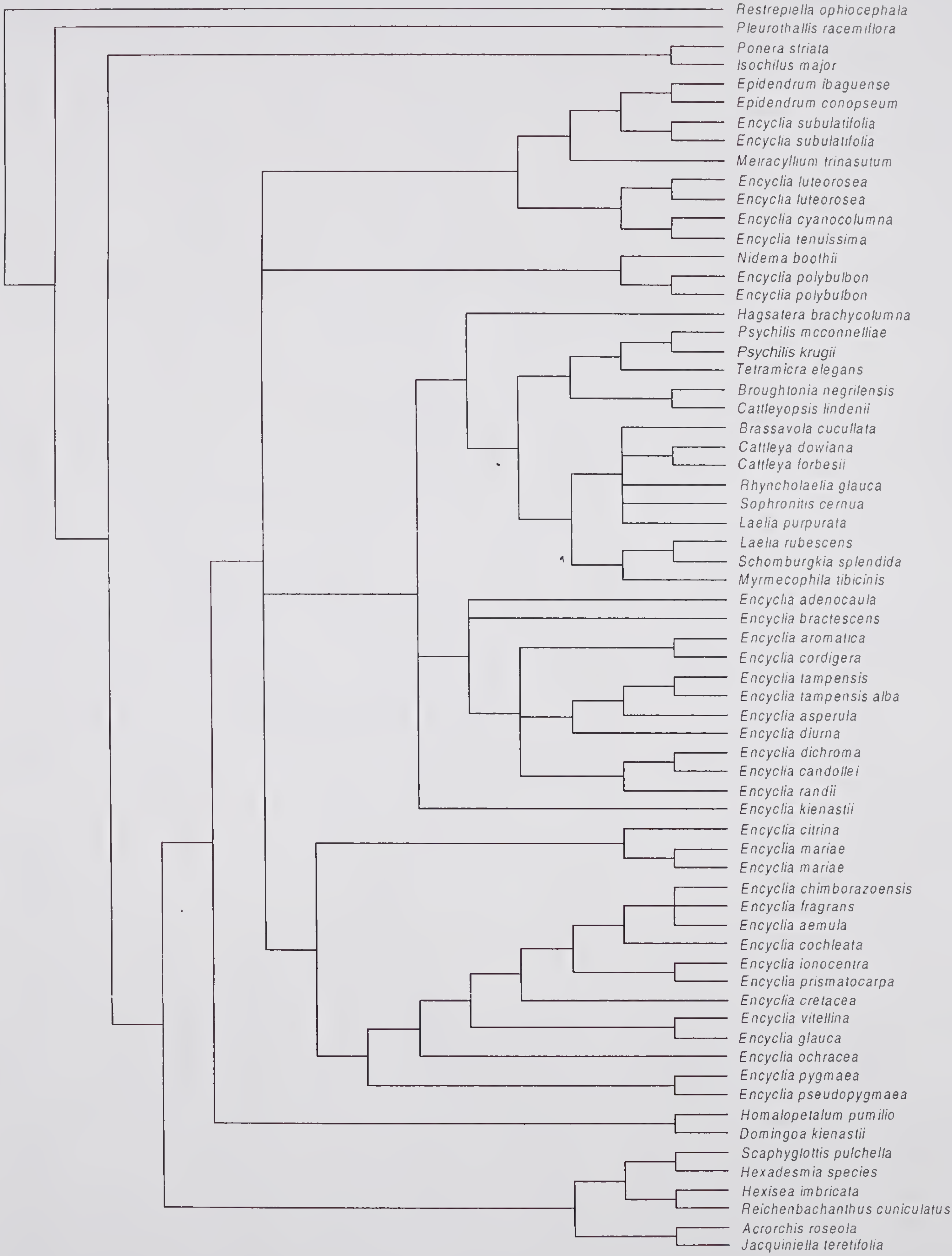

Figure 4-4. Equally weighted strict consensus tree for the holomorphology matrix of 40 equally parsimonious trees of 3237 steps. The trees statistics are CI = 0.515, RI = 0.570, and RC = 0.294.

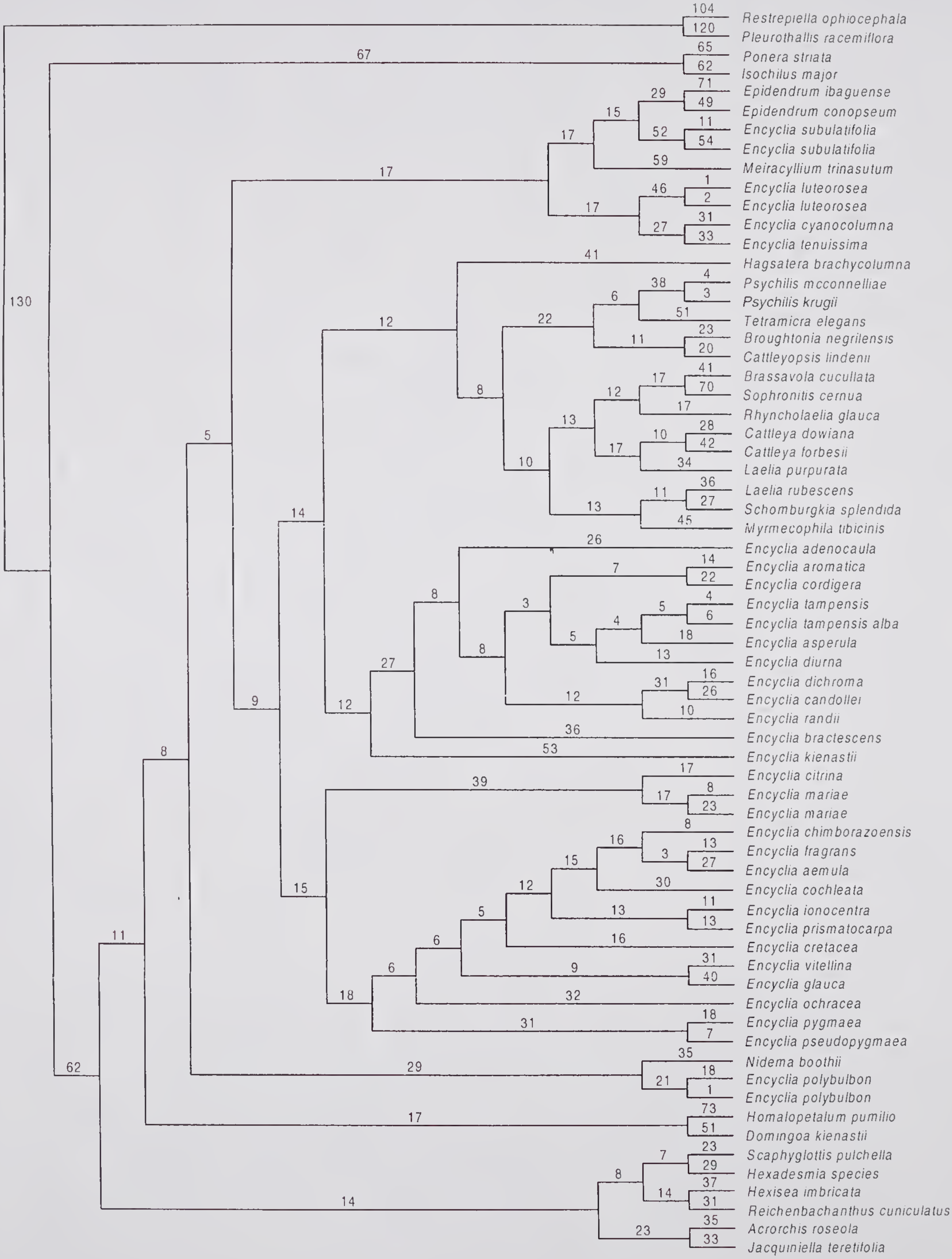

Figure 4-5. Randomly selected tree for equally weighted holomorphology. The branch lengths are indicated in number of steps.

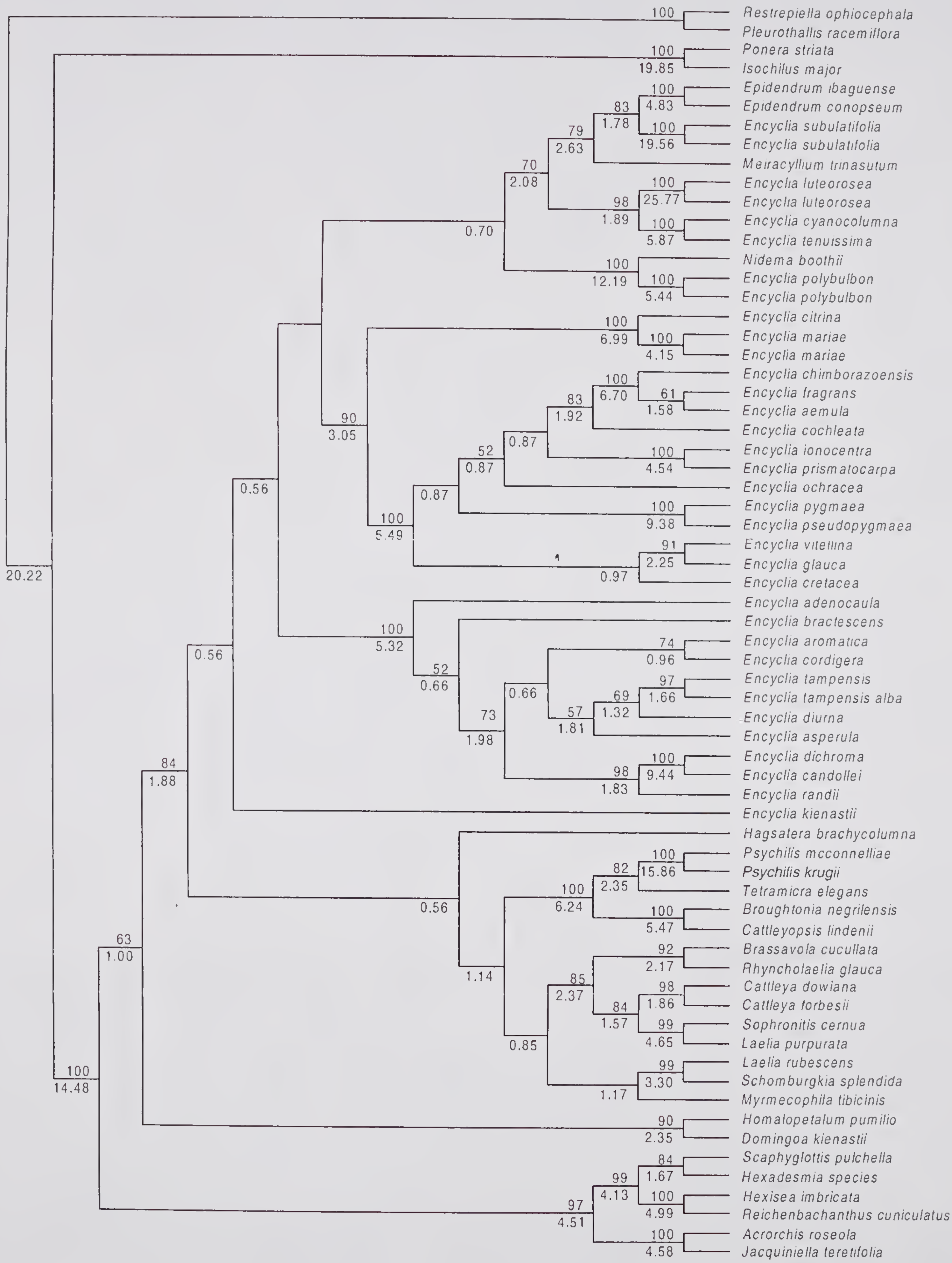

Figure 4-6. Weighted tree for holomorphology with 3242 steps. The tree statistics were CI = 0.514, RI = 0.569, and RC = 0.292. Bootstrap percentages greater than 50 percent are given above the line. Decay indices greater than 0.5 steps are indicated below the line.

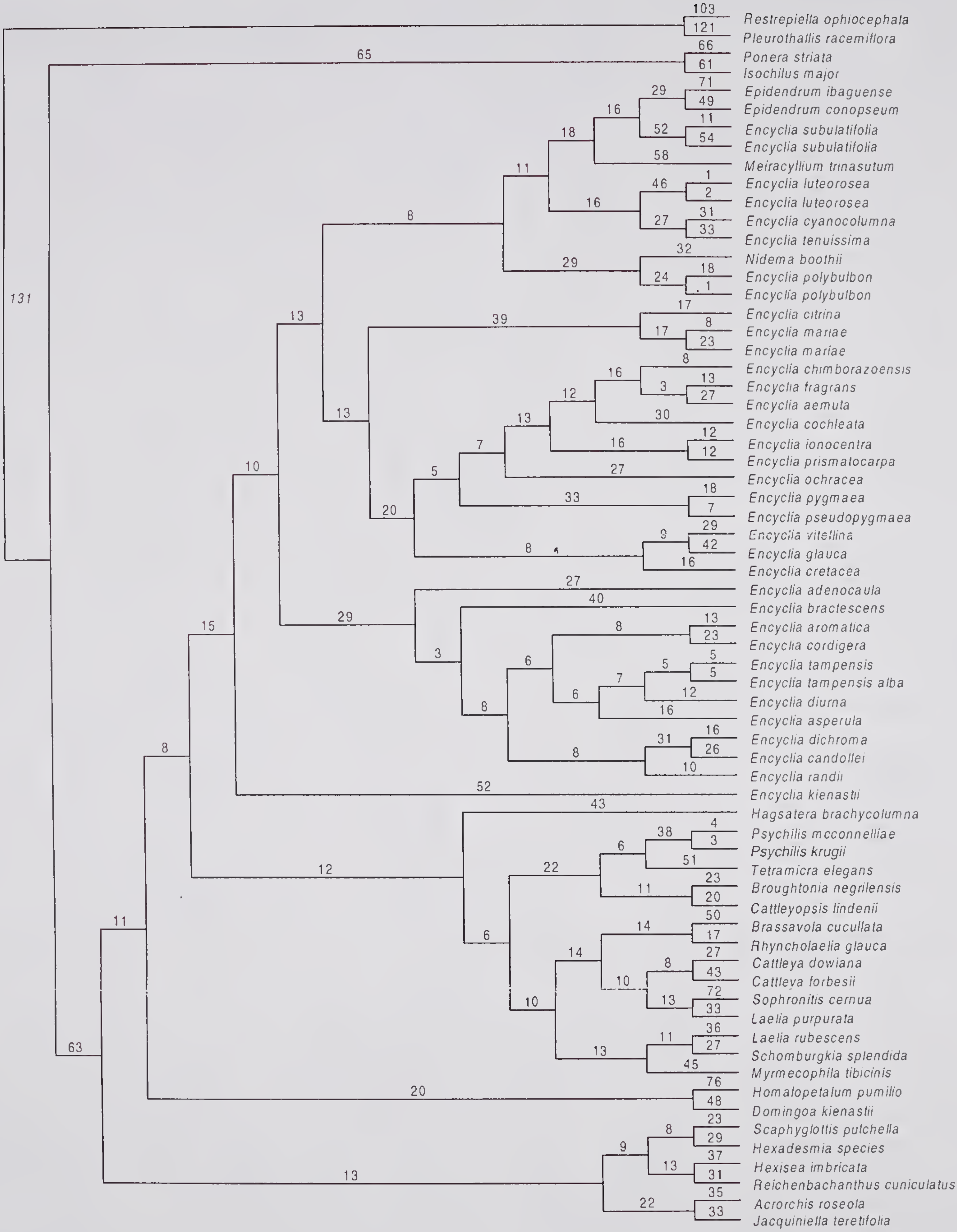

Figure 4-7. The tree for weighted holomorphology. The branch lengths are indicated in number of steps.

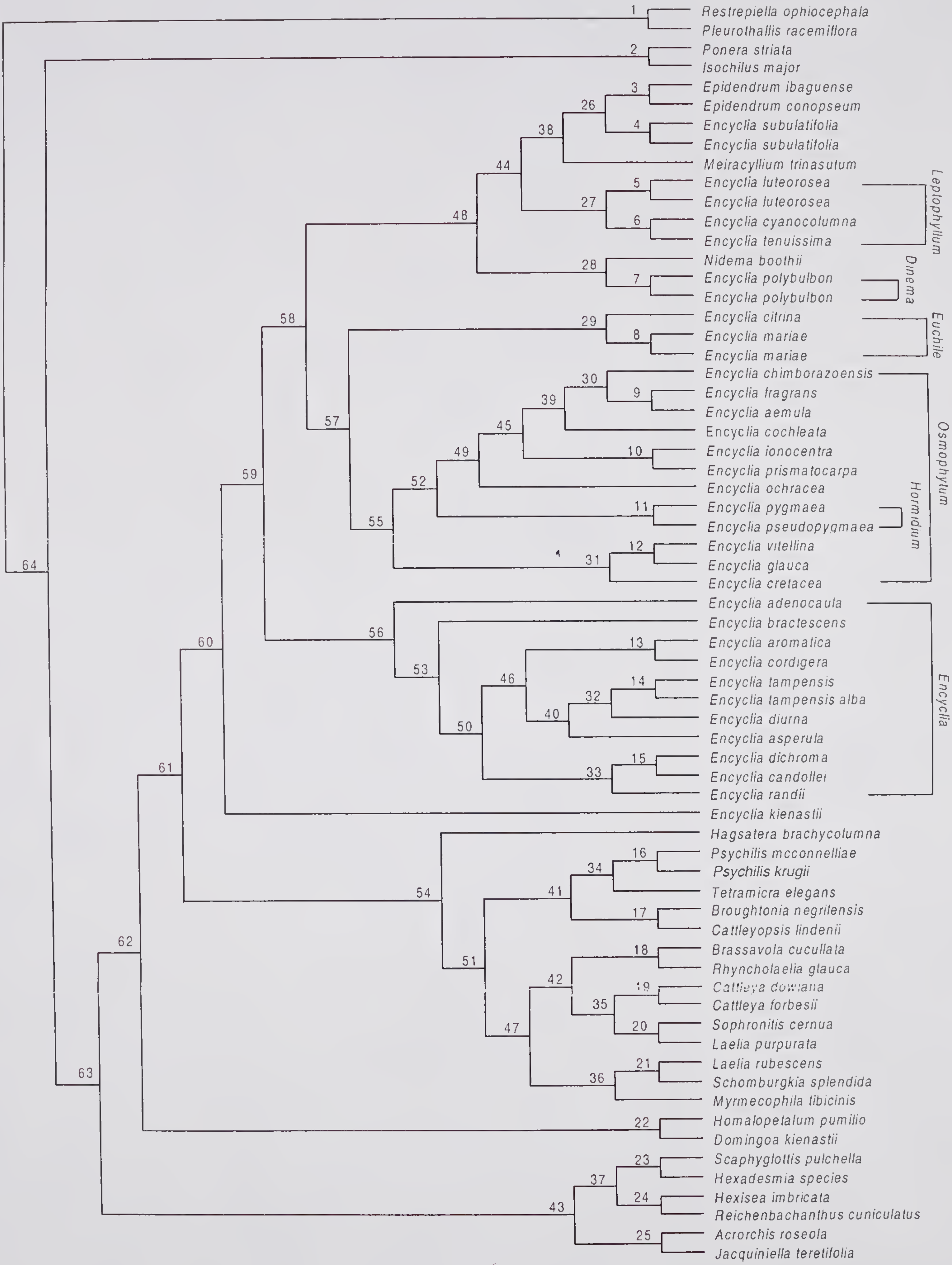

Figure 4-8. The tree for weighted holomorphology. The node reference numbers for the clades are listed above the lines. Dressler's sectional names are listed to the right of the clades.

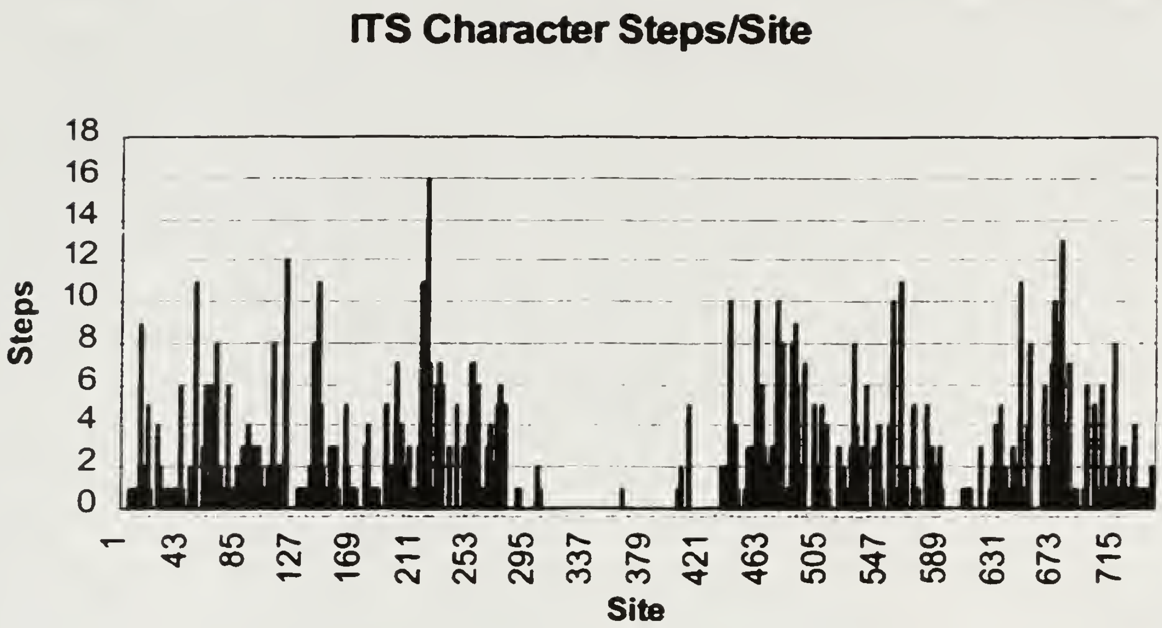

Figure 4-9. ITS Character Steps/Site. Sites 274-437 are the 5.8S ribosomal gene.

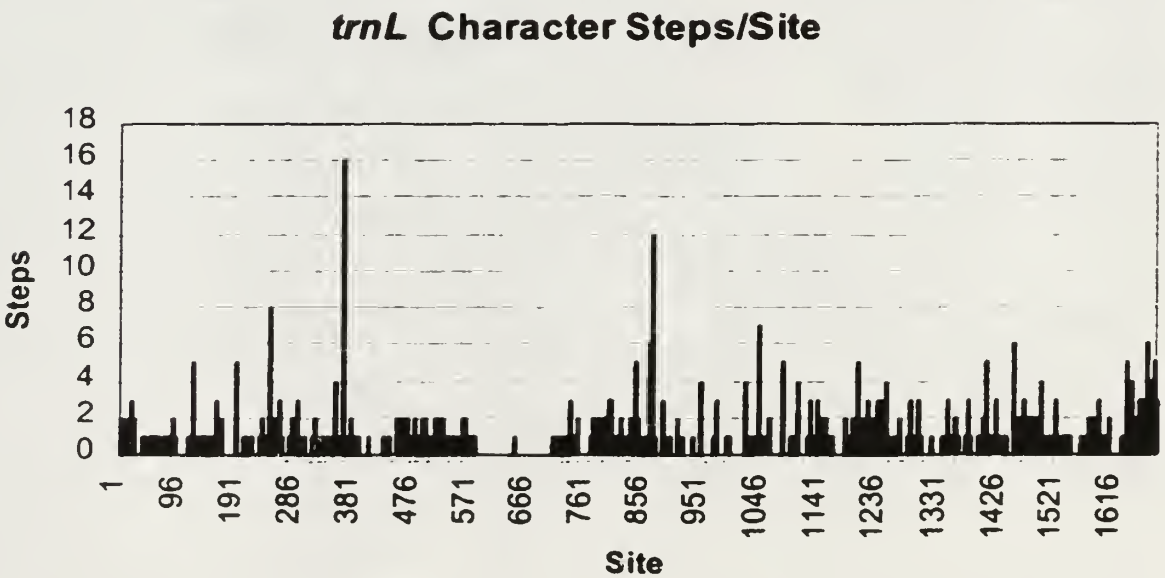

Figure 4-10. *trnL-F* Character Steps/Site. Sites 379-710 are an insert in the *trnL* intron for four taxa.

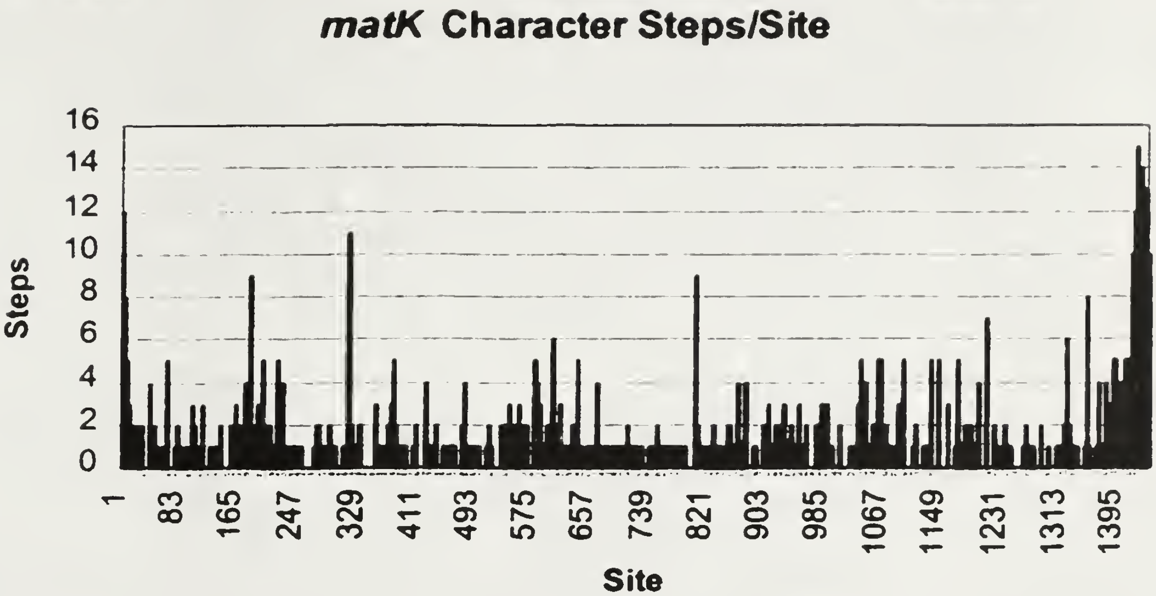

Figure 4-11. *matK* Character Steps/Site. The sites in the matK gene have a pattern similar to the *trnL* spacer.

CHAPTER 5
APPLICATIONS AND CONCLUSIONS

Introduction

The goal of taxonomy is to provide a classification system that is natural and predictive. A natural system of classification reflects the biological history of the group. For instance, an unnatural classification would be one that placed all red flowered orchids in one genus and white flowered in another, etc. A predictive system allows the user to correctly place unknown plants based on characteristics of known plants or conversely to predict unknown characters for known plants. This philosophy dictates that when new information reveals errors in the current classification of an organism, the name must be changed (Higgins, 1999).

Application of Results

Obtaining a tree may be the end of systematic analysis but it is the starting point for biosystematics and classification. The phylogeny produced is the basis for a classification system. This tree may be used to study character evolution, biogeography, pollination syndromes, etc. by mapping events onto the topology. Since the objective of this research was to resolve the phylogeny of *Encyclia* to sectional level and to determine the position of *Encyclia* within the subtribe Laeliinae, the topology of the

holomorphological tree will be used to revise the classification of *Encyclia* sensu Dressler in appropriate journals.

Taxonomic History

The taxonomic history of an organism is important to trace the application of nomenclature and to understand the classification concepts of other taxonomists. Changes in generic delimitation are common as taxonomists subdivide (or combine) genera into logical groups. Modern analytical methods often confirm the taxonomic insight of early systematists.

General overview

The history of *Encyclia* is a series of lumping and splitting taxonomic events. Soon after Hooker (1828) established the genus, Lindley combined it with *Epidendrum*. In 1881, Bentham stated that *Epidendrum* was an enormous genus and that section *Encyclium* may be subdivided into three series, *Dinema*, *Prosthechea*, and *Encyclia* (Bentham, 1881). However, it was Schlechter (1914b) who revived usage of *Encyclia* at the generic level. Dressler (1961) further redefined *Encyclia*, expanding on the concepts of Bentham. No sooner than Dressler had assembled the genus, other taxonomists began to disassemble it. (For a comparison of recent classification schemes see Table 5-1.) Breiger (1969; 1970) started moving taxa into *Anacheilium* and *Hormidium*. Pabst (1981) refined Breiger's concepts and moved additional taxa. Higgins (1997) resurrected the genus *Prosthechea* for *Encyclia* subgenus *Osmophytum*. Brieger, Pabst, and Higgins agree in the treatment of *Dinema* and *Encyclia sensu stricto* but differ in the treatment of the remaining sections of *Encyclia sensu* Dressler (Table 5-1).

Table 5-1. Comparison of recent *Encyclia* Classifications.

Dressler (1961)	Brieger (1970)	Pabst (1981)	Higgins (1997)
Encyclia Subg. *Dinema*	*Dinema*	*Dinema*	*Dinema*
Encyclia Subg. *Encyclia*	*Encyclia*	*Encyclia*	*Encyclia*
Encyclia Sect. *Encyclia*			
Encyclia Sect. *Leptophyllum*			
Encyclia Subg. *Osmophytum*			*Prosthechea*
Encyclia Sect. *Osmophytum*	*Anacheilium*	*Anacheilium*	
Encyclia Sect. *Hormidium*	*Hormidium*	*Hormidium*	
Encyclia Sect. *Euchile*	*Hormidium* Sect. *Euchile*	*Anacheilium* Sect. *Euchile*	

Specific histories

The taxonomic history of the genera associated with *Encyclia* is a web of taxonomic events. The previous taxonomic treatments of *Encyclia* and *Prosthechea* are a complex succession of invalid and misapplied nomenclature involving the following seven generic names: *Epidendrum* L. (1763), *Encyclia* Hook. (1828), *Dichaea* Lindl. (1833), *Prosthechea* Knowles & Westc. (1838), *Epithecia* Knowles & Westc. (1839), *Hormidium* Lindl. ex Heynhold (1841), and *Anacheilium* Hoffmanns. (1842). This classical case of nomenclatural confusion has resulted in a problematic taxonomic classification of the genus *Encyclia*.

Dichaea. When Swartz described the taxon *Epidendrum glaucum* in 1788 he placed it in *Epidendrum* sensu Linnaeus (Swartz, 1788). Lindley transferred the taxon to *Dichaea glauca* (Sw.) Lindl. in 1833, thus establishing the genus *Dichaea* (1831). Unexplicably, Rudolf Schlechter (1914-15) transferred 20 *Dichaea* taxa to *Epithecia*, an invalid name for a different taxon. Schlechter listed *Dichaea glauca* Lindl. as a synonym for *Epithecia glauca* of Knowles and Westcott (1915). This was incorrect because *Dichaea* was based on *Epidendrum glaucum* Sw. not *Epidendrum glaucum* (Knowles &

Westc.) Lindl. Schlechter was probably confused by Lindley's treatment of *Epidendrum glaucum* (Knowles & Westcot.) Lindley not *Epidendrum glaucum* of Swartz. Rudolf Schlechter attempted to revive *Epithecia* by including 20 taxa into the genus (1914a; 1915). All of the species placed in *Epithecia* by Schlechter are now members of the Maxillarieae, not Epidendreae. Schlechter's revision must be rejected because *Epithecia* is a superfluous name (Greuter, et al., 1994). Schlechter may have been confused by Lindley's transfer of *Epidendrum glaucum* Sw. to *Dichaea*.

Hormidium. After the description of *Hormidium uniflorum* (Lindl.) Heynh. in 1841, the generic name was unused until it was revived by Cogniaux (1898). Schlechter (1914a; 1915) and Brieger (1969; 1970) had already began transferring plants into the genus when Pabst, Moutinho, and Pinto (1981) presented their revision of *Hormidium*. Although the genus *Hormidium* Lindl. ex Heynh. is validly published (Dressler, 1970), this group of over 100 species, treated as *Hormidium* by Brieger (Brieger and Hunt, 1969), includes *Prosthechea glauca* and the generic name *Prosthechea* has priority.

Anacheilium. Following the publication of *Anacheilium cochleatum* (L.) Hoffmanns. in 1842, the generic name had only been used for one other taxon, *A. fragrans* (Sw) Acuña (Acuña Gale, 1939), until it was applied to the species of *Encyclia* section *Osmophytum* by Pabst, Moutinho, and Pinto (1981). However, *Anacheilium* does not have priority for this group of taxa because an older name exists. Acuña Gale accepted the genus *Anacheilium* Rchb. ex Hoffmanns. placing *Epidendrum fragrans* Sw. in the genus along with *Anacheilium cochleatum* (L.) Hoffmanns. (Hoffmannsegg, 1842).

Prosthechea. Knowles and Westcott first published *Prosthechea* in 1838 to describe the species *P. glauca* (Knowles and Westcott, 1838). However, in the following year they changed the generic name to *Epithecia* because they felt that *Prosthechea*

was too similar to another unspecified generic name (Knowles and Westcott, 1839). Examination of the generic names published in *Index Kewensis* revealed the very similar previously published generic name *Prosthesia* by Blume in 1826 (Violaceae)(Blume, 1826; Royal Botanic Gardens Kew, 1993). This may be the unspecified name that induced Knowles and Westcott to change the generic name from *Prosthechea* to *Epithecia*. Since *Prosthechea* is not a homonym of *Prosthesia,* the original publication is valid according to the *International Code of Botanical Nomenclature*, (Greuter, et al., 1994). This new name was illegitimate since *Prosthechea* had been validly published and should have been accepted by the authors. The derivation of the name *Prosthechea* (pros-the-*key*-a) is from the Greek word προσθη'κη (*prostheke*), in reference to the appendage of tissue on the back of the column of *Prosthechea glauca*.

Osmophytum. *Epidendrum* section *Osmophytum* was established by Lindley for plants with usually scented flowers (Lindley, 1839). Subsequently, Lindley (1840) transferred *P. glauca* to *Epidendrum*, making the combination *Epidendrum glaucum* (Knowles & Westcott) Lindley thus recognizing *Epithecia glauca* Knowles & Westcott as a synonym and placing it in *Epidendrum* section *Osmophytum* (Lindley, 1840). This combination is illegitimate since it is a later homonym of *Epidendrum glaucum* Swartz, which was transferred to *Dichaea* by Lindley himself. *Prosthechea glauca* was subsequently transferred to *Encyclia* as *E. glauca* (Knowles & Westcott) Dressler & Pollard and assigned to *Encyclia* subgenus *Osmophytum* (Lindley) Dressler (Dressler and Pollard, 1971). *Prosthechea* has been resurrected by the author (Higgins, 1997) and the species in *Encyclia* subgenus *Osmophytum* have been renamed *Prosthechea*. The Florida varieties of *Prosthechea*, *Prosthechea boothiana* (Lindley) W. E. Higgins var. *erythronioides* (Small) W. E. Higgins and *Prosthechea cochleata* (Linnaeus) W. E. Higgins var. *triandra* (Ames) W. E. Higgins, have also been renamed (Higgins, 1998).

Euchile. Taxa in this group have been assigned to *Cattleya*, *Epidendrum*, *Encyclia*, *Hormidium*, or *Prosthechea* at various times. *Encyclia* section *Euchile* was described by Dressler for anomalous taxa in *Encyclia* subgenus *Osmophytum* (1971). Withner (1998) raised the sectional name to generic status because of the uncharacteristic pattern of epidermal cells.

Encyclia. Hooker described the genus *Encyclia* based on *Encyclia viridiflora* in 1828. Subsequently, Lindley sunk the genus into *Epidendrum* subgenus *Encyclium* in 1853. *Encyclia* was unused until Schlechter revived it (Schlechter, 1914b). Other taxonomist then started placing various taxa in the genus. Lemée (1955) inexplicably transferred five taxa from *Epidendrum* subgenus *Aulizeum* Lindl. to *Encyclia* enlarging the circumscription of *Encyclia* by Schlechter. However, it was not until 1961 that Dressler circumscribed *Encyclia* describing two sections, *Encyclia* section *Encyclia* and *Encyclia* section *Osmophytum*. Subsequently, Dressler revised the genus to include six sections and three subgenera (Dressler and Pollard, 1971). Pabst, Moutinho, and Pinto transferred the taxa in *Encyclia* section *Hormidium* Dressler to *Hormidium* raising that group to generic level and placing *Encyclia* section *Euchile* into *Hormidium* Lindl. ex Heynh (Pabst, et al., 1981). Pabst, Moutinho, and Pinto (1981) transferred the taxa in *Encyclia* section *Osmophytum* to *Anacheilium*. The author agrees with Dressler that *Encyclia* sections *Osmophytum* and *Hormidium* are not sharply differentiated (Dressler, 1970). Pabst was correct in his removal of *Encyclia* subgenus *Osmophytum* from *Encyclia*, but splitting the clade into two genera was unjustified.

Dinema. The genus *Dinema* was established in 1831 when Lindley made the combination *Dinema polybulbon* (Sw.) Lindl. (1831). The taxon had originally been described as *Epidendrum polybulbon* by Swartz (1788). In 1961, Dressler transferred

the taxon to *Encyclia* (1961). *Encyclia* subgenus *Dinema* (Lindley) Dressler and Pollard was established in 1974 because the taxon did not fit into the other subgenera (Dressler and Pollard, 1974).

Phylogenetic Classifications

Phylogenetic classifications are based on monophyletic groups. This type of classification will be more predictive because diversity is a result of genealogical descent. These predictive classifications are useful to scientists by linking the various disciplines of biology (Judd, et al., 1999). However, the process of ranking is still subjective, thus some systematists reject the use of Linnaean ranks (Dahlgren, 1983). A monoplyletic group could be a tribe, a subtribe, a genus, etc. When the hierarchical naming scheme of Linnaean ranks are used, adjacent clades should be ranked at the same level (Stevens, 1995). Subclades are given ranks below the major clade. A secondary consideration in the application of ranks is the ease of identification based on morphology (Backlund and Bremer, 1998). This modified Linnaean system is the classification scheme used for this study. The clades discussed below are referenced to node numbers in Figure 4-8.

Subtribal classification

This research revealed a required change in subtribal delimitation. Since *Meiracyllium* (node 38) falls within Laeliinae (node 64), subtribe Meiracylliinae must be abandoned to make Laeliinae monophyletic. This change is being published as part of a larger study of Laeliinae (van den Berg, et al., 2000).

Generic classification

Two genera in this study are not monophyletic and need revision. The genus *Encyclia* sensu Dressler is polyphyletic and cannot be supported as currently delimited. The restructuring of the genus is discussed below. The other polyphyletic genus is *Laelia*. The Mexican species, *Laelia rubescens*, is in a different clade than the South American species, *Laelia purpurata*. A detailed investigation of the phylogeny of *Laelia* is beyond the scope of this dissertation.

Subgeneric classification

Only two of the three subgenera of *Encyclia* are monophyletic. *Encyclia* subgenus *Osmophytum* (node 57) forms a monophyletic group of *Encyclia* sections *Osmophytum*, *Euchile*, and *Hormidium*. Thus, the resurrection of the older name for this clade, *Prosthechea* Knowles and Wescott, is supported by this research. *Encyclia* subgenus *Dinema* (node 7) is monophyletic but it is not in the same clade with the remainder of *Encyclia*. *Nidema* is sister to the *Encyclia* subgenus *Dinema* clade (node 28). Thus, the older generic name *Dinema* should be used for this group. *Encyclia* subgenus *Encyclia* (node 56) is polyphyletic due to the placement *Encyclia* section *Leptophyllum*. This will be discussed under sectional classification.

Sectional classification

Only two of the five remaining sections of *Encyclia* are monophyletic. *Encyclia* section *Osmophytum* (node 55) is paraphyletic because of the placement of *Encyclia* section *Hormidium* within it. *Encyclia* section *Hormidium* (node 11) is monophyletic but imbedded in *Encyclia* section *Osmophytum*. Discarding *Encyclia* section *Hormidium* will make *Encyclia* section *Osmophytum* monophyletic.

Encyclia section *Euchile* (node 29) is monophyletic and sister to *Encyclia* section *Osmophytum*. Here is an example of the subjective nature of ranking decisions. Higgins included *Encyclia* section *Euchile* in *Prosthechea* while Withner raised *Encyclia* section *Euchile* to generic status. This research supports either classification since both *Prosthechea* and *Euchile* form monophyletic groups.

Encyclia section *Encyclia* (node 56) is polyphyletic because of the placement of *E. kienastii*. Removal of this taxon makes the remaining group monophyletic. This clade is recognized as the true encyclias by Withner (1996). Withner's interpretation of *Encyclia* is supported by this research. This interpretation also agrees with Hooker's description of the genus.

Encyclia section *Leptophyllum* (node 27) is polyphyletic because of the placement of *E. subulatifolia*, which traditionally included within this group. The clade is also segregated from the remaining sections of *Encyclia*. None of the taxa in this clade have an available older generic name that can be used for the group. Thus, a new generic name is needed for *Encyclia* section *Leptophyllum* (excluding *E. subulatifolia*).

New classification

Encyclia section *Leptophyllum* is a monophyletic group that must be raised to generic status. However, since the sectional name *Leptophyllum* is occupied at the generic level in Caryophyllaceae (Ehrhart, 1784), a new name is required for this group. The name *Ostlundia*, proposed here, commemorates Karl Erik Magnus Östlund (1875-1938) who collected the type specimen for the genus.

Ostlundia W. E. Higgins, gen. nov.

Planta epiphytica, foliis graminiformibus, pseudobulbis fasciculatis, ovoideis a conico-ovoideis, inflorescentia simplice vel ramosa, floribus paucis a multis, labelo unilobato adnato a columna papillato vel carnoso-porcato, columna recta tridentata, dente mediano parvo obtuso, dentibus lateralibus grandibus aliformibus, rostello horizontale.

Type: *Epidendrum cyanocolumna* Ames, Hubb. & Schweif.

Description — **Pseudobulbs** clustered or up to 3 cm apart on rhizome, ovoid, spheric-ovoid, conic-ovoid, or fusiform-ovoid, 0.7-7 cm long, 0.3-2.5 cm wide; **leaves** 1-3 per pseudobulb, linear, ligulate-linear, or elliptic-ligulate, obtuse or acute, 3.5-25 cm long, 0.15-1 cm wide; **Inflorescence** simple or branched with 2-12 flowers, 5-45 cm long; **color** sepals and petals pale yellow, yellow, orange-yellow, olive-green, or green-yellow shading distally to brown or purplish brown, lip yellow, orange-yellow, or cream-white centrally marked with dull violet or green stripe, column yellow, orange-yellow, green-yellow, dark purple or blue-violet; **sepals** linear-lanceolate, elliptic-oblong, oblong-oblanceolate, or oblanceolate, obtuse, subobtuse, or acute, 7-18 mm long, 1.5-3 mm wide; **petals** spatulate or oblanceolate-spatulate, oblanceolate-linear, sublinear, linear, or oblanceolate, attenuate, subobtuse, obtuse or acute, 7-17 mm long, 0.5-3 mm wide; **lip** basally adnate or adnate to column for about 1/3-3/5 length of column, total length 8-16 mm; the blade lanceolate, obovate or cuneate-obovate, or cuneate, acute, retuse or obtuse, 8.5-10 mm long, 3.5-7 mm wide; callus of 2 explanate or fleshy ridges or keels at base of blade, together subquate, passing into 3 of 5-7 very fleshy, warty, verrucose, or papillose veins which run nearly to the apex of the lip, outer veins may be crenulate; **column** about 3-6 mm long, slender, the mid-tooth obtuse, shorter than the

wing-like lateral teeth which are subequal or surpass the anther, lateral teeth joined by horizontal rostellum. **Capsule** ellipsoid, about 15-20 mm long, 5-8 mm wide.

Taxa:

Ostlundia cyanocolumna (Ames, Hubb. & Schweif.) W. E. Higgins comb. nov.

Basionym: *Epidendrum cyanocolumna* Ames, Hubb. & Schweif. Bot. Mus. Leafl. 3:2. 1934. Based on K. E. M. Östlund 2413, Teziutlan, Puebla, Mexico.

Ostlundia distantiflora (Rich. & Gal.) W. E. Higgins comb. nov.

Basionym: *Epidendrum distantiflorum* Rich. & Gal. Ann Sci. Nat. III 3:19, 1845. Based on Galeotti 5250 Mirador, Veracruz, Mexico.

Ostlundia luteorosea (Rich. & Gal.) W. E. Higgins comb. nov.

Basionym: *Epidendrum luteoroseum* Rich. & Gal. Ann Sci. Nat. III 3:19, 1845. Based on Galeotti 5233, Mexico.

Ostlundia tenuissima (Ames, Hubb. & Schweif.) W. E. Higgins comb. nov.

Basionym: *Epidendrum tenuissimum* Ames, Hubb. & Schweif. Bot. Mus. Leafl. 3:15. 1934. Based on K. E. M. Östlund 2246, Barranca de las Minas, Michoacan, Mexico.

Specific classification

Two taxa require new names as the result of this research. *Encyclia subulatifolia* is sister to *Epidendrum*. Thus, the older name, *Epidendrum subulatifolium* Richard & Galeotti, should be used. *Encyclia kienastii* is not sister to *Epidendrum* so the older

name of *Epidendrum kienastii* Rchb.f., is inappropriate. Since *E. kienastii* does not form a clade with any other genus, additional research is required to find an appropriate name or status.

Rejected classifications

Three generic names used for taxa in this study must be rejected: *Anacheilium, Hormidium*, and *Epithecia*. *Anacheilium* has been used for taxa in the cockleshell group (node 39) of *Prosthechea*. Recognition of this clade would make *Prosthechea* polyphyletic, and therefore, must be rejected. The same reasoning applies to *Hormidium* and it too must be rejected because it violates the principles of phylogenetic classification. *Epithecia* is simply an invalid name according to international rules of nomenclature.

Project Summary

A project of this scope has an evolution of its own. During the preliminary analyses, some out the supposed outgroups fell within the clade containing the sections of *Encyclia*. Additional outgroups were added until the position of the sections of *Encyclia* became stable in the analysis (Graybeal, 1998). Since *Encyclia* is polyphyletic, the choice of outgroups is critical. Had only *Epidendrum* or *Cattleya* been used, Encyclia would have appeared monophyletic. Both of these genera would be reasonable choices based on previous studies. *Cattleya* is sister to *Encyclia* in a *rbcL* analysis and *Encyclia* was segregated from *Epidendrum* based on morphology. The cost of having a comprehensive outgroup is that fewer resources can be dedicated to the study of ingroup taxa. An additional detriment in Laeliinae is that as outgroup taxa

were added homoplasy of the morphological characters increased, although homoplasy was evident to some degree in all of the matrices.

The molecular study was also modified as the research progressed. The choice of gene to be sequenced greatly affects resolution. Previous studies can suggest possible candidates but a preliminary study is needed. Initially, *rbcL* was sequenced for 12 taxa in Laeliinae but the variation was too low to be informative. Then the ITS region was sequenced but the resolution was poor due to homoplasy. The *trnL-F* region was added and better resolution was achieved but support was weak. Coding of *trnL-F* and *matK* indels helped improve resolution. The *matK* gene was then sequenced looking for improved resolution in deeper levels of the topology. The combined DNA produced reasonable resolution and support.

The taxonomic consequences of this research are that five of the six sections of *Encyclia* have been raised to generic status. Two have new generic names and three reverted to older names. One sectional name, *Hormidium*, has been rejected, as its recognition would lead to a non-monophyletic section *Osmophytum*. The revised classification is presented in Figure 5-1.

Continued Research

The results of this project have posed a number of unanswered questions that warrant additional research. The *Epidendrum* clade (node 26) needs additional sampling to verify that *Epidendrum subulatifolia* is a member of that group. *Laelia* needs additional study to resolve the differences between the Mexican and South American species. This study of *Laelia* is in progress by Cassio van den Berg at RBG, Kew. Resolution among the *Encyclia sensu stricto* (node 56) needs further study because the

DNA sequences in this group have very little variation. A more extensive analysis of more taxa using a more sensitive technique such as ISSRs or AFLPs is needed. Finally, more taxa from *Prosthechea* (node 55) need to be sequenced to examine the relationships between the resupinate and nonresupinate members of the genus.

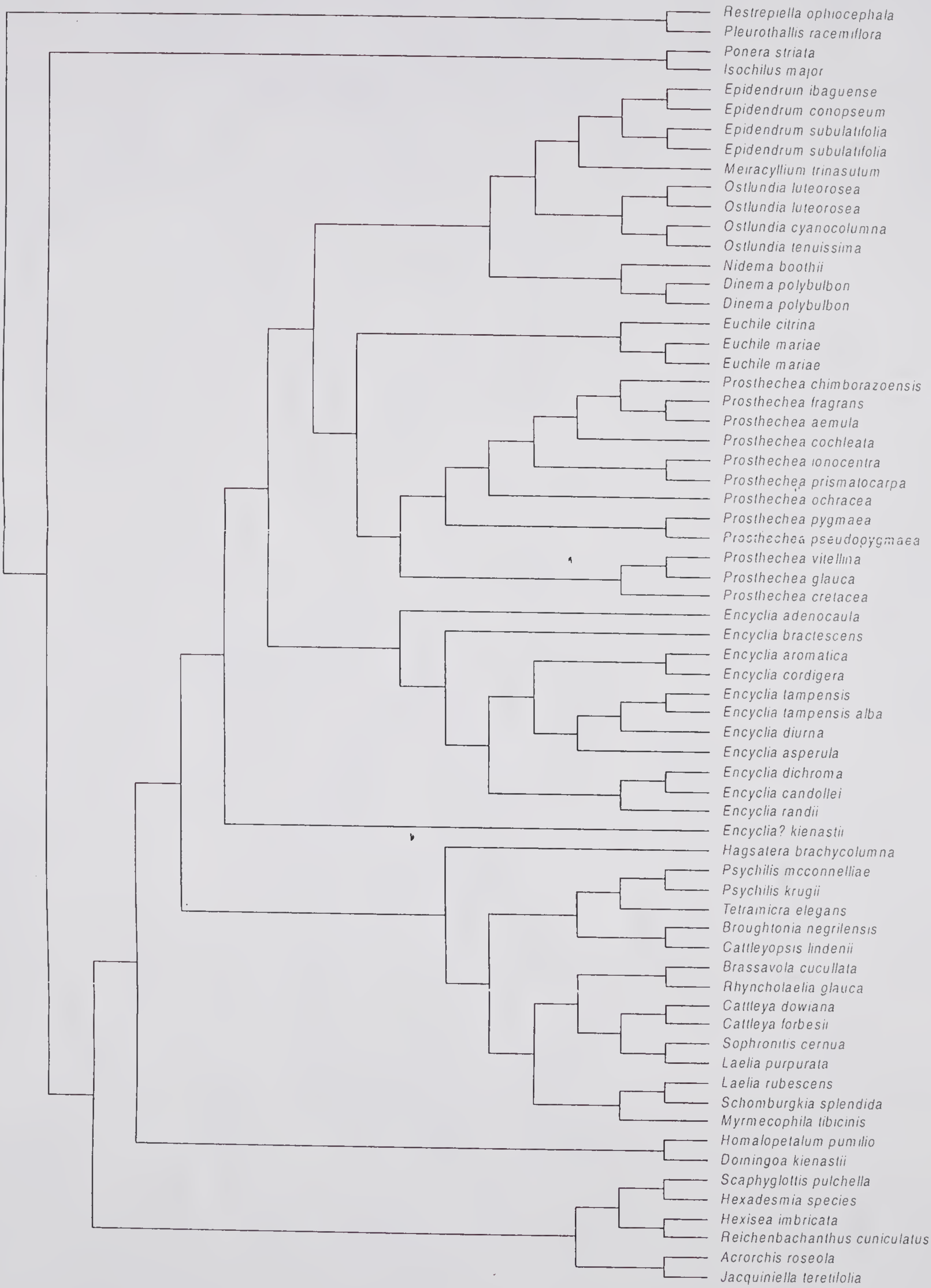

Figure 5-1. Revised Classification. The classification above is supported by the holomorphology analysis.

APPENDIX A
SPECIMEN VOUCHER NUMBERS

Taxon	Collection Number	Voucher Number
Acrorchis roseola Dressler	WMW 399	FLAS Dressler
Brassavola cucullata (L.) R. Br.	WEH 130	FLAS 198290
Broughtonia negrilensis Fowlie	WEH 152	FLAS 198288
Cattleya dowiana Bateman	O-282	KEW Chase
Cattleya forbesii Lindl.	WEH 59	FLAS 200709
Cattleyopsis lindenii Cogn.	WEH 251	FLAS 198289
Domingoa kienastii (Rchb.f.) Dressler	WEH 225	FLAS 198291
Encyclia adenocaula (Llave and Lex.)Schltr.	WEH 12	FLAS 198274
Encyclia aromatica (Bateman) Schltr.	WEH 2	FLAS 200710
Encyclia asperula Dressler & G. E. Pollard	WEH 65	FLAS 200711
Encyclia bractescens (Lindl.) Hoehne	WEH 21	FLAS 198275
Encyclia candollei (Lindl.) Schltr.	WEH 29	FLAS 200712
Encyclia cordigera (H. B. K.) Dressler	WEH 24	FLAS 198276
Encyclia dichroma (Lindl.) Schltr. in Schlechter	WEH 74	FLAS 198278
Encyclia diuma Schltr. in Fedde	WEH 9	FLAS 200713
Encyclia kienastii (Rchb.f.) Dressler & Pollard	WEH 235	AMO EH9273
Encyclia randii (Barb. Rodr.) Porto & Brade	WEH 50	FLAS 200715
Encyclia tampensis (Lindl.) Small	WEH 27	FLAS 198277
Encyclia tampensis alba (Lindl.) Small	WEH 23	FLAS 200716
Encyclia cyanocolumna (Ames, F.T. Hubb. & C. Schweinf.) Dressler	WEH 1001	FLAS 200717
Encyclia luteorosea (Rich. & Gal.) Dressler & Pollard	WEH 173	Bussey
Encyclia luteorosea (Rich. & Gal.) Dressler & Pollard	WEH 178	Orquideas del Valle, Columbia
Encyclia subulatifolia (A.Rich & Galeotti) Dressler	WEH 128	AMO J577
Encyclia subulatifolia (A.Rich & Galeotti) Dressler	WEH 174	FLAS 200718
Encyclia tenuissima (Ames, Hubb. & Schweinf.) Dressler	WEH 143	FLAS 200719
Encyclia aemula (Lindl.) Carnevali & I. Ramírez	WEH 17	FLAS 198279
Encyclia chimborazoensis (Schltr.) Dressler	WEH 51	FLAS 200720
Encyclia cochleata (L.) Lemée	WEH 31	FLAS 198280
Encyclia cretacea Dressler & Pollard	WEH 230	AMO MAS
Encyclia fragrans (Sw.) Lemée	WEH 172	FLAS 200721
Encyclia glauca (Knowles and Westc.) Dressler and Pollard	WEH 176	FLAS 200722
Encyclia ionocentra Dressler	WEH 46	FLAS 200723
Encyclia ochracea (Lindl.) Dressler	WEH 95	FLAS 200724
Encyclia prismatocarpa (Rchb. f) Dressler	WEH 19	FLAS 198283
Encyclia vitellina (Lindl.) Dressler	WEH 57	FLAS 198282
Encyclia pseudopygmaea (Finet) Dressler & Pollard	WEH 205	FLAS 200725
Encyclia pygmaea (Hook.) Dressler	WEH 81	FLAS 198281
Encyclia citrina (Llave and Lex.) Dressler	WEH 54	FLAS 198269
Encyclia mariae (Ames) Hoehne	WEH 56	FLAS 200726
Encyclia mariae (Ames) Hoehne	WEH 87	FLAS 200727
Encyclia polybulbon (Sw.) Dressler	WEH 61	FLAS 200728

Appendix A—continued.

Taxon	Colletion	Voucher
Encyclia polybulbon (Sw.) Dressler	WEH 94	FLAS 200729
Epidendrum ibaguense Pavon ex Lindl.	WEH 60	FLAS 198270
Epidendrum conopseum {R. Br. in} Ait.	WEH 244	FLAS 198271
Hagsatera brachycolumna (L.O. Williams) R.González	WEH 229	FLAS 198272
Hexadesmia cf. Brongn.	O-336	KEW Chase
Hexisea imbricata (Lindl.) Rchb.f.	WMW 117	SEL 1990-0262
Homalopetalum pumilio (Rchb.f.) Schltr.	WEH 234	FLAS 200730
Isochilus major Cham. & Schltdl.	WMW 279	FLAS W-93199
Jacquiniella teretifolia (Sw.) Britton & P. Wilson	WEH 313	FLAS 200731
Laelia purpurata Lindl. & Paxton	WEH 84	SEL 84-0459
Laelia rubescens Lindl.	O-284	KEW Chase
Meiracyllium trinasutum Rchb.f.	WEH 129	FLAS 200732
Myrmecophila tibicinis (Bateman) Rolfe	WEH 281	FLAS 200734
Nidema boothii (Lindl.) Schltr.	WEH 192	FLAS 198273
Pleurothallis racemiflora Lindl. ex Lodd.	WEH 140	FLAS 198267
Ponera striata Lindl.	WEH 197	FLAS 198268
Psychilis mcconnelliae Sauleda	WEH 53	FLAS 198287
Psychilis krugii (Bello) Sauleda	WEH 62	FLAS 200735
Reichenbachanthus cuniculatus (Schltr.) Pabst.	WMW 107	FLAS W-96051
Restrepiella ophiocephala (Lindl.) Garay and Dunsterv.	O-291	KEW Chase
Rhyncholaelia glauca (Lindl.) Schltr.	WEH 134	FLAS 200736
Scaphyglottis pulchella (Schltr.) L.O. Williams	WMW 208	FLAS W-97009
Schomburgkia splendida Schltr.	WMW 280	FLAS W-93026
Sophronitis cernua Lindl.	WEH 145	FLAS 200737
Tetramicra elegans (Hamilt.)Cogn.	WEH 160	FLAS 198285

APPENDIX B
CHARACTER STATE DELIMITATION

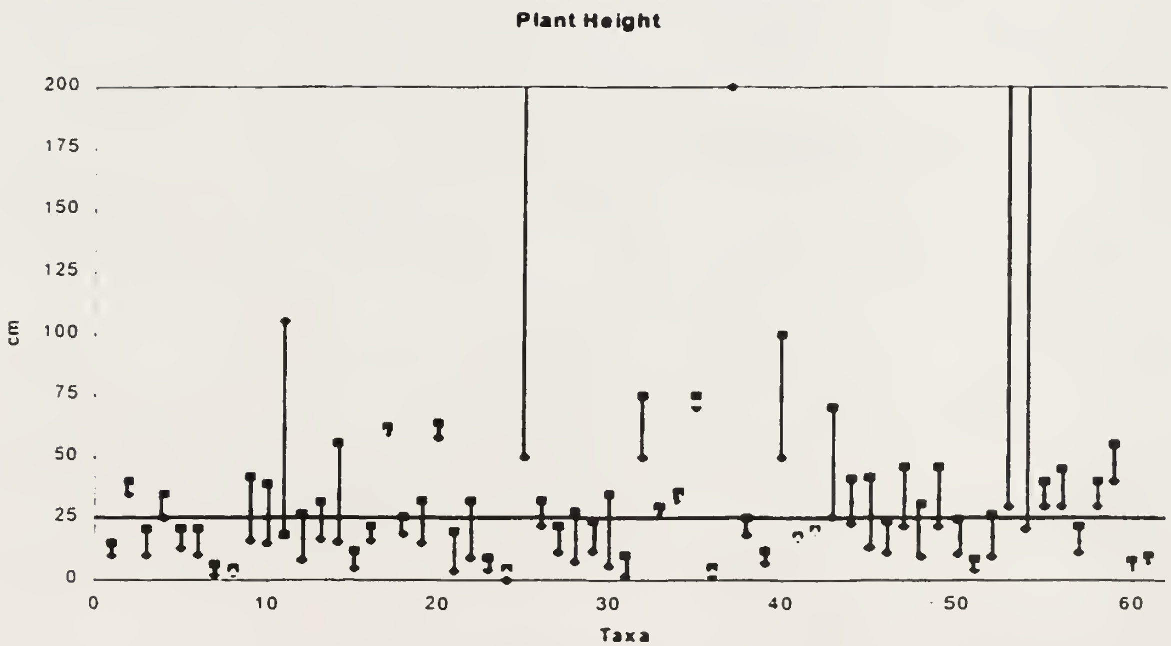

Figure B-1. Plant Height. The maximum value is represented by a square, the average a triangle, and the minimum by a diamond. The average values were coded as being greater or less than 25 cm.

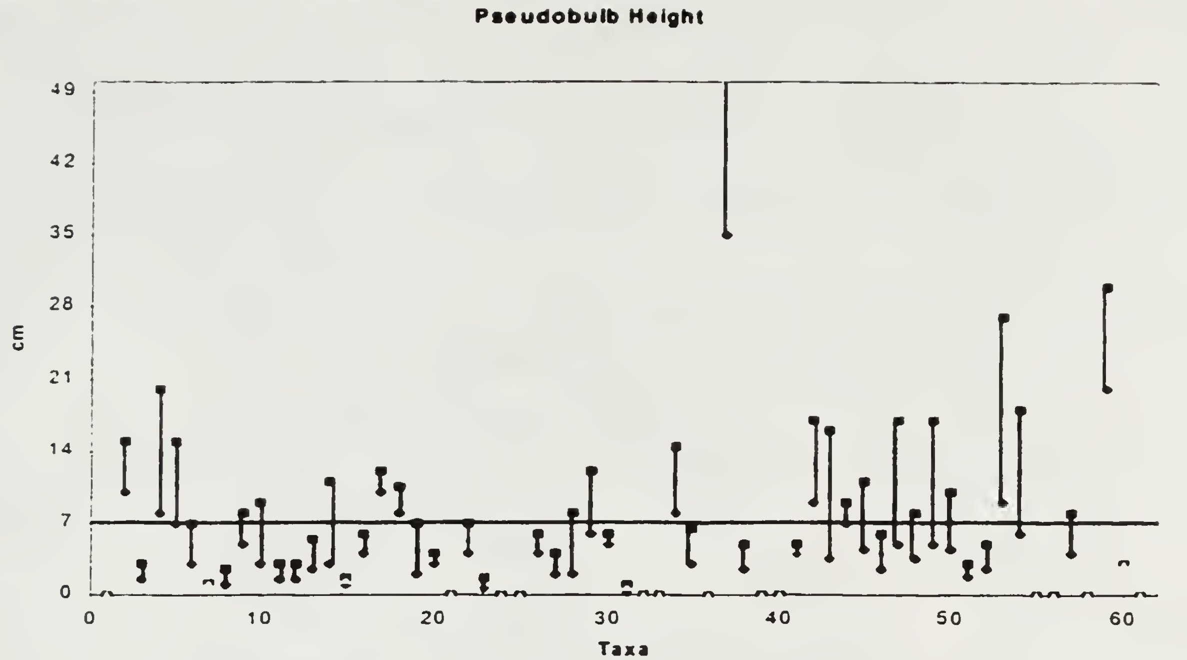

Figure B-2. Pseudobulb Height. The maximum value is represented by a square, the average a triangle, and the minimum by a diamond. The average values were coded as being greater or less than 7 cm.

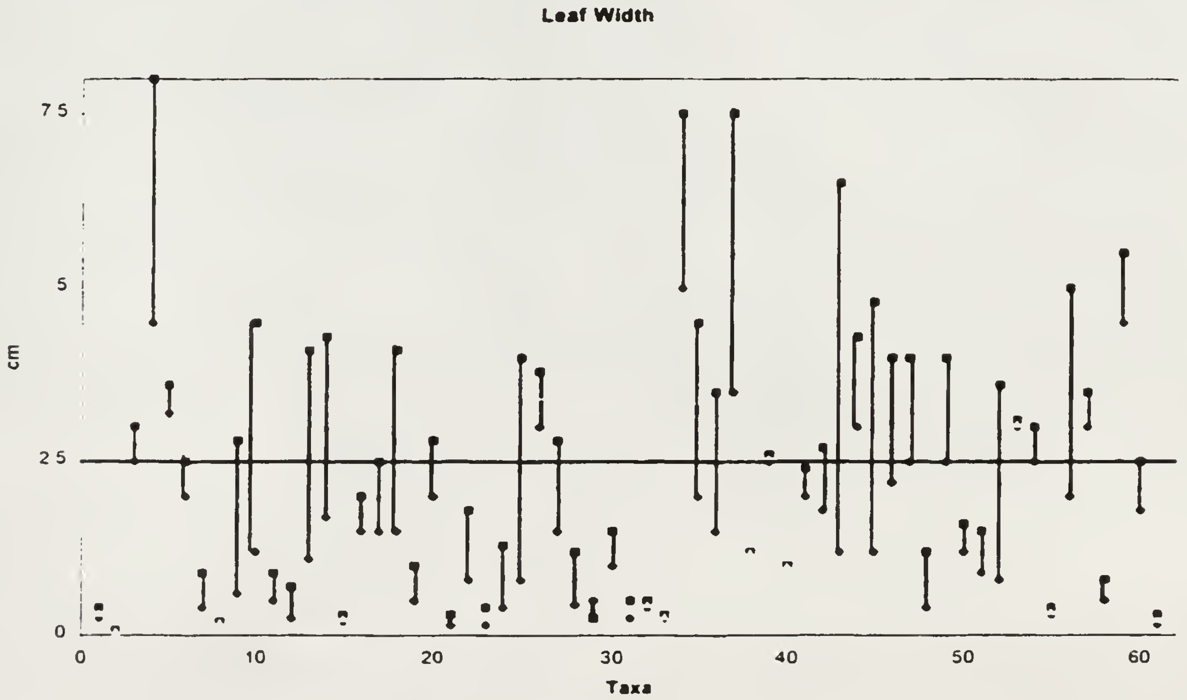

Figure B-3. Leaf Width. The maximum value is represented by a square, the average a triangle, and the minimum by a diamond. The average values were coded as being greater or less than 2.5 cm.

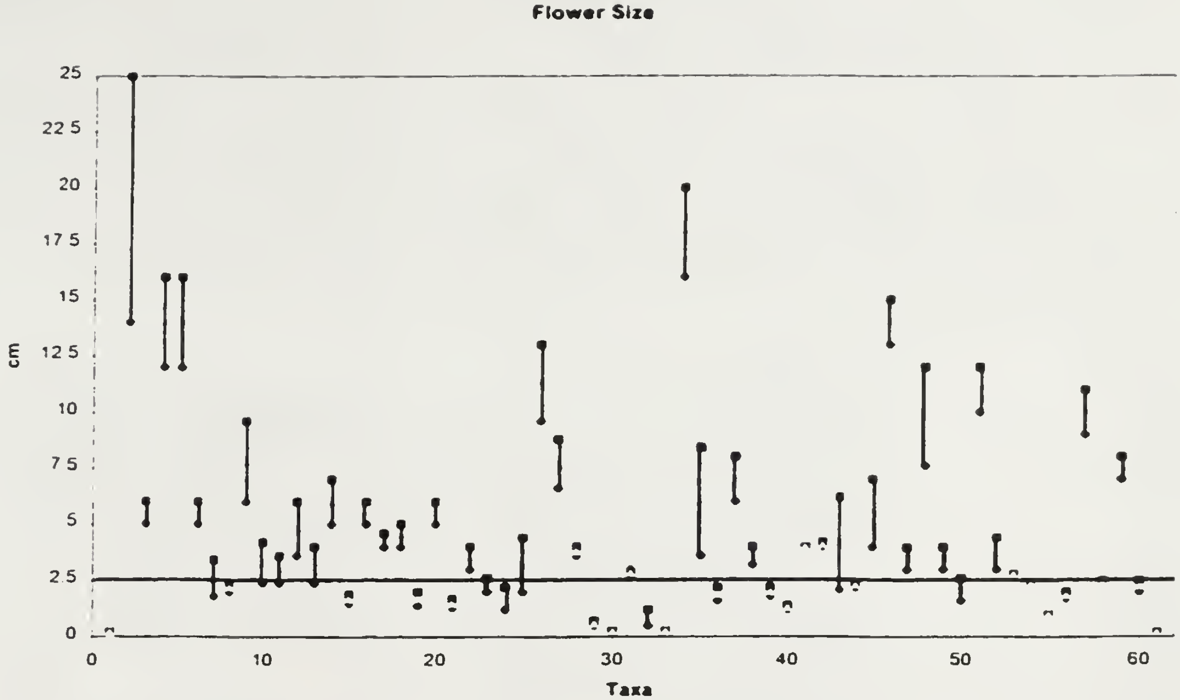

Figure B-4. Flower Size. The maximum value is represented by a square, the average a triangle, and the minimum by a diamond. The average values were coded as being greater or less than 2.5 cm.

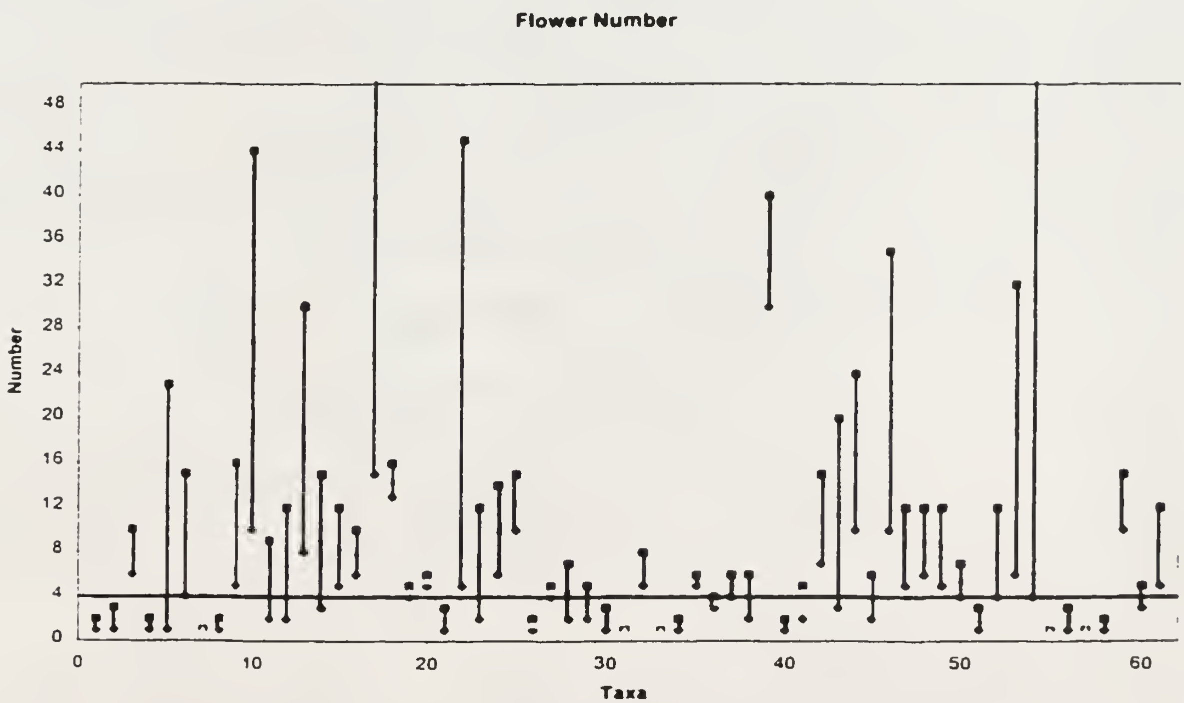

Figure B-5. Flower Number. The maximum value is represented by a square, the average a triangle, and the minimum by a diamond. The average values were coded as being greater or less than four.

APPENDIX C
USEFUL FORMULAE

Table B-1. CTAB extraction buffer.

Compound	Amount
Tris, 1 M, pH 8.0	20 ml
EDTA, 0.25 M, pH 8.0	20 ml
NaCl	16.4 g
CTAB	4.0 g
Water	to 200 ml

Table B-2. SEVAG for DNA extractions.

Compound	**Amount**
Chloroform	240 ml
Isoamyl alcohol (IAA)	10 ml

Table B-3. Sodium Acetate, 3M.

Compound	**Amount**
Sodium acetate, anhydrous	24.6 g
Glacial acetic acid	5 ml
Water	to 100 ml
pH	adjust to 4.8

Table B-4. TE buffer (10 mM Tris, 0.1 mM EDTA, pH 8.0).

Compound	**Amount**
TRIS HCl, 1 M stock, pH 8.0	1.0 ml
EDTA, 0.1 M, pH 8.0	100 μl
Water	to 100 ml

Aliquot into microfuge tubes and keep frozen.

Table B-5. Tris-Borate Buffer (TBE), 10 X stock.

Compound	**Amount**
Tris base	108.0 g
Boric acid	55.09 g
Na_2 EDTA	8.3 g
Water	to 1000 ml

May require gentle warming to dissolve.

Table B-6. Ethidium Bromide (10mg/ml) stock.

Compound	Amount
EtBr	1 g
water;	to 100 ml

Stir for hours

Wrap in foil to protect from light

Table B-7. Gel Loading Dye.

Compound	Amount
Bromphenol Blue (0.25%)	0.0025g
Sucrose (40% w/v)	4 g
TE, 5X	10 ml

Store at 4 C.

Dilute with additional 40% sucrose for 'lite' loading dye.

Table B-8. dNTP mix, dilution of stocks for PCR.

Compound	Amount
dATP	40 µl
dCTP	40
dGTP	40
dTTP	40
Water	240 µl

Aliquot into small tubes and store at -20.

Table B-9. MgCl2, 1 M.

Compound	Amount
MgCl2•6H2O	203.3 g
Water	800 ml; adjust to 1000 ml

Autoclave

Table B-10. 10X PCR reaction Buffer.

Compound	Amount
Tris-HCl	100 mM
KCl	500 mM
$MgCl_2$	15 mM
Gelatin	0.1% (w/v)

Table B-11. 5X Cycle Sequencing Buffer.

Compound	Amount
TRIS base	400 mM (=48.44 g)
$MgCl_2 \bullet 6H_20$	10 mM (=2.03 g)
Water	to 1 liter
pH	adjust to 9.0

Table B-12. EDTA 0.5 M, pH 8.0.

Compound	Amount
EDTA, disodium dihydrate (mw 372.2)	168.1 g
Water	800 ml of (stir and heat on hotplate)
pH	to 8.0 with NaOH pellets (≈200g)
Water	to 1 liter

Autoclave

Tris-HCl buffer solutions can be conveniently prepared from stock solutions of Tris base and stock solutions of Tris hydrochloride.

Table B-13. Tris base 1 M stock solution.

Compound	Amount
Tris base:	12.1 g in
Water	to 100 ml

Table B-14. Tris HCl 1 M stock solutions.

Compound	Amount
Tris HCl:	15.7 g in
Water	to 100 ml

Table B-15. Tris 1M buffers of given pH.

pH	1 M Tris HCl	1M Tris base
7.0	94.9 ml	5.1 ml
7.2	91.7 ml	8.3 ml
7.4	87.0 ml	13.0 ml
7.6	80.6 ml	19.3 ml
7.8	72.0 ml	28.0 ml
8.0	61.2 ml	38.7 ml

(Sigma-Aldrich Co., 1999)

Notes: Water for preparing all solutions should always be molecular biology grade.
The pH is adjusted by adding NaOH or HCl to the solution.

APPENDIX D
ITS DNA COMPOSITION ANALYSIS

Taxon: *Encyclia tampensis*. Input sequence length: 643
DNA Base Composition Report
Number of A bases = 131 (20.37 %)
Number of C bases = 186 (28.93 %)
Number of G bases = 212 (32.97 %)
Number of T bases = 114 (17.73 %)
Number of N bases = 0 (0.00 %)

Pos(bp)	(A-T)/(A+T)	SD(A-T)	(C-G)/(C+G)	SD(C-G)	(G+C)/(A+T+C+G)%	SD(%G+C)
25	20.00	19.60	-20.00	19.60	50.00	7.07
35	8.33	20.34	-23.08	19.08	52.00	7.07
45	10.00	22.25	-20.00	17.89	60.00	6.93
55	5.88	24.21	-9.09	17.34	66.00	6.70
65	-20.00	25.30	2.86	16.90	70.00	6.48
75	-25.00	24.21	11.76	17.03	68.00	6.60
85	-20.00	25.30	2.86	16.90	70.00	6.48
95	-33.33	27.22	-10.53	16.13	76.00	6.04
105	-5.88	24.21	-15.15	17.21	66.00	6.70
115	29.41	23.18	-21.21	17.01	66.00	6.70
125	37.50	23.18	-17.65	16.88	68.00	6.60
135	42.86	19.72	-17.24	18.29	58.00	6.98
145	53.85	16.53	8.33	20.34	48.00	7.07
155	63.64	16.45	14.29	18.70	56.00	7.02
165	36.36	19.86	7.14	18.85	56.00	7.02
175	39.13	19.19	-11.11	19.13	54.00	7.05
185	14.29	21.60	-3.45	18.56	58.00	6.98
195	-11.11	23.42	-6.25	17.64	64.00	6.79
205	-20.00	21.91	-13.33	18.09	60.00	6.93
215	-9.09	21.23	-7.14	18.85	56.00	7.02
225	-13.04	20.67	3.70	19.23	54.00	7.05
235	-9.09	21.23	14.29	18.70	56.00	7.02
245	0.00	20.41	0.00	19.61	52.00	7.07
255	13.04	20.67	-3.70	19.23	54.00	7.05
265	13.04	20.67	-11.11	19.13	54.00	7.05
275	13.04	20.67	-18.52	18.91	54.00	7.05
285	30.43	19.86	-18.52	18.91	54.00	7.05
295	27.27	20.51	0.00	18.90	56.00	7.02
305	12.00	19.86	-12.00	19.86	50.00	7.07
315	20.00	19.60	-12.00	19.86	50.00	7.07
325	33.33	20.57	3.45	18.56	58.00	6.98
335	36.84	21.33	3.23	17.95	62.00	6.86
345	33.33	22.22	-6.25	17.64	64.00	6.79
355	33.33	27.22	0.00	16.22	76.00	6.04
365	33.33	27.22	5.26	16.20	76.00	6.04
375	14.29	26.45	11.11	16.56	72.00	6.35
385	0.00	25.00	17.65	16.88	68.00	6.60
395	6.67	25.76	31.43	16.05	70.00	6.48
405	6.67	25.76	20.00	16.56	70.00	6.48
415	0.00	28.87	10.53	16.13	76.00	6.04
425	0.00	28.87	0.00	16.22	76.00	6.04
435	9.09	30.03	-12.82	15.88	78.00	5.86
445	-27.27	29.01	-17.95	15.75	78.00	5.86
455	-33.33	27.22	-15.79	16.02	76.00	6.04
465	-23.08	26.99	-18.92	16.14	74.00	6.20
475	-14.29	26.45	-22.22	16.25	72.00	6.35
485	-33.33	24.34	-14.29	16.73	70.00	6.48
495	0.00	25.00	-23.53	16.67	68.00	6.60

Appendix D—continued.

Pos(bp)	(A-T)/(A+T)	SD(A-T)	(C-G)/(C+G)	SD(C-G)	(G+C)/(A+T+C+G)%	SD(%G+C)
505	12.50	24.80	-29.41	16.39	68.00	6.60
515	10.00	22.25	-33.33	17.21	60.00	6.93
525	-5.26	22.91	-29.03	17.19	62.00	6.86
535	-15.79	22.65	-41.94	16.30	62.00	6.86
545	-33.33	22.22	-31.25	16.79	64.00	6.79
555	-8.33	20.34	-23.08	19.08	52.00	7.07
565	-41.67	18.56	-7.69	19.55	52.00	7.07
575	-23.08	19.08	-8.33	20.34	48.00	7.07
585	0.00	19.61	16.67	20.13	48.00	7.07
595	-4.00	19.98	12.00	19.86	50.00	7.07
605	-20.00	21.91	20.00	17.89	60.00	6.93
615	6.67	25.76	2.86	16.90	70.00	6.48

APPENDIX E
trnL DNA COMPOSITION ANALYSIS

Taxon: *Encyclia tampensis*. Input sequence length: 1114
DNA Base Composition Report
Number of A bases = 381 (34.20 %)
Number of C bases = 190 (17.06 %)
Number of G bases = 186 (16.70 %)
Number of T bases = 356 (31.96 %)
Number of N bases = 1 (0.09 %)

Pos(bp)	(A-T)/(A+T)	SD(A-T)	(C-G)/(C+G)	SD(C-G)	(G+C)/(A+T+C+G)%	SD(%G+C)
25	-18.52	18.91	-39.13	19.19	46.00	7.05
35	-18.52	18.91	-47.83	18.31	46.00	7.05
45	-10.34	18.47	-23.81	21.19	42.00	6.98
55	10.34	18.47	-14.29	21.60	42.00	6.98
65	17.24	18.29	4.76	21.80	42.00	6.98
75	31.03	17.65	-4.76	21.80	42.00	6.98
85	37.93	17.18	14.29	21.60	42.00	6.98
95	24.14	18.02	4.76	21.80	42.00	6.98
105	10.34	18.47	-4.76	21.80	42.00	6.98
115	25.00	17.12	-22.22	22.98	36.00	6.79
125	27.27	16.75	-29.41	23.18	34.00	6.70
135	37.14	15.69	-60.00	20.66	30.00	6.48
145	45.45	15.51	-76.47	15.63	34.00	6.70
155	56.25	14.62	-55.56	19.60	36.00	6.79
165	40.00	16.73	-50.00	19.36	40.00	6.93
175	33.33	17.21	-40.00	20.49	40.00	6.93
185	20.00	17.89	-20.00	21.91	40.00	6.93
195	9.68	17.88	-15.79	22.65	38.00	6.86
205	12.50	17.54	-11.11	23.42	36.00	6.79
215	6.25	17.64	11.11	23.42	36.00	6.79
225	12.50	17.54	11.11	23.42	36.00	6.79
235	22.58	17.50	5.26	22.91	38.00	6.86
245	21.21	17.01	29.41	23.18	34.00	6.70
255	18.75	17.36	22.22	22.98	36.00	6.79
265	25.71	16.33	20.00	25.30	30.00	6.48
275	23.53	16.67	25.00	24.21	32.00	6.60
285	14.29	16.73	33.33	24.34	30.00	6.48
295	39.39	16.00	41.18	22.10	34.00	6.70
305	23.53	16.67	50.00	21.65	32.00	6.60
315	23.53	16.67	50.00	21.65	32.00	6.60
325	14.29	16.73	33.33	24.34	30.00	6.48
335	14.29	16.73	20.00	25.30	30.00	6.48
345	2.86	16.90	6.67	25.76	30.00	6.48
355	2.86	16.90	20.00	25.30	30.00	6.48
365	-8.57	16.84	20.00	25.30	30.00	6.48
375	-16.67	16.43	42.86	24.15	28.00	6.35
385	-11.11	16.56	28.57	25.61	28.00	6.35
395	0.00	16.22	16.67	28.46	24.00	6.04
405	15.00	15.63	-20.00	30.98	20.00	5.66
415	36.84	15.08	-66.67	21.52	24.00	6.04
425	36.84	15.08	-83.33	15.96	24.00	6.04
435	31.58	15.39	-33.33	27.22	24.00	6.04
445	13.51	16.29	-53.85	23.37	26.00	6.20
455	22.22	16.25	-42.86	24.15	28.00	6.35
465	13.51	16.29	-23.08	26.99	26.00	6.20
475	16.67	16.43	0.00	26.73	28.00	6.35
485	11.11	16.56	-28.57	25.61	28.00	6.35
495	16.67	16.43	0.00	26.73	28.00	6.35

Appendix E—continued.

Pos(bp)	(A-T)/(A+T)	SD(A-T)	(C-G)/(C+G)	SD(C-G)	(G+C)/(A+T+C+G)%	SD(%G+C)
505	2.86	16.90	6.67	25.76	30.00	6.48
515	-2.86	16.90	6.67	25.76	30.00	6.48
525	-5.56	16.64	-14.29	26.45	28.00	6.35
535	0.00	17.15	-12.50	24.80	32.00	6.60
545	14.29	16.73	-33.33	24.34	30.00	6.48
555	18.75	17.36	-33.33	22.22	36.00	6.79
565	9.09	17.34	-29.41	23.18	34.00	6.70
575	26.67	17.60	0.00	22.36	40.00	6.93
585	39.39	16.00	5.88	24.21	34.00	6.70
595	17.65	16.88	12.50	24.80	32.00	6.60
605	20.00	16.56	6.67	25.76	30.00	6.48
615	23.53	16.67	0.00	25.00	32.00	6.60
625	16.67	16.43	-28.57	25.61	28.00	6.35
635	-3.03	17.40	-41.18	22.10	34.00	6.70
645	-7.14	18.85	0.00	21.32	44.00	7.02
655	0.00	18.26	20.00	21.91	40.00	6.93
665	10.34	18.47	33.33	20.57	42.00	6.98
675	-7.69	19.55	50.00	17.68	48.00	7.07
685	-20.00	17.89	80.00	13.42	40.00	6.93
695	-20.00	17.89	80.00	13.42	40.00	6.93
705	-62.50	13.80	77.78	14.81	36.00	6.79
715	-75.76	11.36	88.24	11.41	34.00	6.70
725	-63.64	13.43	52.94	20.58	34.00	6.70
735	-39.39	16.00	52.94	20.58	34.00	6.70
745	-21.05	15.86	16.67	28.46	24.00	6.04
755	-5.56	16.64	14.29	26.45	28.00	6.35
765	0.00	16.67	14.29	26.45	28.00	6.35
775	-12.82	15.88	45.45	26.86	22.00	5.86
785	-11.11	16.56	28.57	25.61	28.00	6.35
795	0.00	16.67	28.57	25.61	28.00	6.35
805	0.00	17.15	33.33	24.34	30.61	6.58
815	5.88	17.12	33.33	24.34	30.61	6.58
825	5.88	17.12	33.33	24.34	30.61	6.58
835	-8.11	16.39	33.33	27.22	24.49	6.14
845	-23.53	16.67	33.33	24.34	30.61	6.58
855	-18.92	16.14	23.08	26.99	26.00	6.20
865	-11.11	16.56	0.00	26.73	28.00	6.35
875	0.00	16.67	-14.29	26.45	28.00	6.35
885	0.00	17.15	0.00	25.00	32.00	6.60
895	-5.88	17.12	25.00	24.21	32.00	6.60
905	5.88	17.12	25.00	24.21	32.00	6.60
915	-8.57	16.84	33.33	24.34	30.00	6.48
925	-8.57	16.84	33.33	24.34	30.00	6.48
935	0.00	16.67	28.57	25.61	28.00	6.35
945	3.03	17.40	-17.65	23.87	34.00	6.70
955	-6.67	18.22	-20.00	21.91	40.00	6.93
965	-9.09	17.34	-29.41	23.18	34.00	6.70
975	-23.53	16.67	-25.00	24.21	32.00	6.60
985	-45.45	15.51	-5.88	24.21	34.00	6.70
995	-40.54	15.03	7.69	27.65	26.00	6.20
1005	-33.33	15.10	27.27	29.01	22.00	5.86
1015	-25.71	16.33	-6.67	25.76	30.00	6.48
1025	-3.23	17.95	-15.79	22.65	38.00	6.86
1035	14.29	18.70	-36.36	19.86	44.00	7.02
1045	11.11	19.13	-30.43	19.86	46.00	7.05
1055	12.00	19.86	-44.00	17.96	50.00	7.07
1065	25.00	19.76	-38.46	18.10	52.00	7.07
1075	-7.14	18.85	-27.27	20.51	44.00	7.02
1085	-17.24	18.29	4.76	21.80	42.00	6.98

APPENDIX F
matK DNA COMPOSITION ANALYSIS

Taxon: *Encyclia tampensis*. Input sequence length: 1438
DNA Base Composition Report:
Number of A bases = 434 {30.18 %}
Number of C bases = 245 {17.04 %}
Number of G bases = 218 {15.16 %}
Number of T bases = 537 {37.34 %}
Number of N bases = 4 { 0.28 %}

Pos{bp}	(A-T)/(A+T)	SD(A-T)	(C-G)/(C+G)	SD(C-G)	(G+C)/(A+T+C+G)%	SD(%G+C)
25	-20.00	16.56	57.14	21.93	28.57	6.45
35	-16.67	16.43	23.08	26.99	26.53	6.31
45	-25.71	16.33	33.33	24.34	30.00	6.48
55	-17.65	16.88	0.00	25.00	32.00	6.60
65	-17.65	16.88	-12.50	24.80	32.00	6.60
75	-8.57	16.84	-20.00	25.30	30.00	6.48
85	-5.88	17.12	-12.50	24.80	32.00	6.60
95	0.00	17.15	-25.00	24.21	32.00	6.60
105	-5.56	16.64	-14.29	26.45	28.00	6.35
115	0.00	16.67	-14.29	26.45	28.00	6.35
125	2.86	16.90	-6.67	25.76	30.00	6.48
135	-5.56	16.64	0.00	26.73	28.00	6.35
145	-11.76	17.03	0.00	25.00	32.00	6.60
155	-9.09	17.34	5.88	24.21	34.00	6.70
165	0.00	17.15	0.00	25.00	32.00	6.60
175	-22.58	17.50	-26.32	22.13	38.00	6.86
185	0.00	18.26	-20.00	21.91	40.00	6.93
195	-18.75	17.36	0.00	23.57	36.00	6.79
205	-33.33	16.41	5.88	24.21	34.00	6.70
215	-39.39	16.00	5.88	24.21	34.00	6.70
225	-31.43	16.05	20.00	25.30	30.00	6.48
235	-41.18	15.63	0.00	25.00	32.00	6.60
245	-23.53	16.67	-25.00	24.21	32.00	6.60
255	-16.13	17.73	-15.79	22.65	38.00	6.86
265	-24.14	18.02	-14.29	21.60	42.00	6.98
275	-37.93	17.18	14.29	21.60	42.00	6.98
285	-3.23	17.95	15.79	22.65	38.00	6.86
295	16.13	17.73	26.32	22.13	38.00	6.86
305	29.41	16.39	12.50	24.80	32.00	6.60
315	27.78	16.01	28.57	25.61	28.00	6.35
325	31.58	15.39	16.67	28.46	24.00	6.04
335	-2.70	16.43	53.85	23.37	26.00	6.20
345	-13.51	16.29	23.08	26.99	26.00	6.20
355	-15.79	16.02	33.33	27.22	24.00	6.04
365	-20.00	15.49	40.00	28.98	20.00	5.66
375	-18.92	16.14	7.69	27.65	26.00	6.20
385	-2.70	16.43	7.69	27.65	26.00	6.20
395	-5.88	17.12	62.50	19.52	32.00	6.60
405	-6.67	18.22	40.00	20.49	40.00	6.93
415	-11.11	19.13	30.43	19.86	46.00	7.05
425	-3.45	18.56	52.38	18.59	42.00	6.98
435	-11.11	19.13	30.43	19.86	46.00	7.05
445	-10.34	18.47	4.76	21.80	42.00	6.98
455	-29.03	17.19	15.79	22.65	38.00	6.86
465	-21.21	17.01	17.65	23.87	34.00	6.70
475	-39.39	16.00	5.88	24.21	34.00	6.70
485	-31.43	16.05	20.00	25.30	30.00	6.48
495	-26.32	15.65	16.67	28.46	24.00	6.04

Appendix F—continued.

Pos{bp}	(A-T)/(A+T)	SD(A-T)	(C-G)/(C+G)	SD(C-G)	(G+C)/(A+T+C+G)%	SD(%G+C)
505	-18.92	16.14	23.08	26.99	26.00	6.20
515	-2.70	16.43	23.08	26.99	26.00	6.20
525	5.56	16.64	28.57	25.61	28.00	6.35
535	-2.70	16.43	38.46	25.60	26.00	6.20
545	16.67	16.43	28.57	25.61	28.00	6.35
555	13.51	16.29	16.67	28.46	24.49	6.14
565	-2.86	16.90	14.29	26.45	28.57	6.45
575	-5.26	16.20	9.09	30.03	22.45	5.96
585	0.00	16.22	-27.27	29.01	22.45	5.96
595	-22.22	16.25	-7.69	27.65	26.53	6.31
605	-27.78	16.01	0.00	26.73	28.00	6.35
615	-22.22	16.25	14.29	26.45	28.00	6.35
625	-23.53	16.67	6.67	25.76	30.61	6.58
635	-27.27	16.75	25.00	24.21	32.65	6.70
645	-35.29	16.05	33.33	24.34	30.61	6.58
655	-33.33	16.41	25.00	24.21	32.65	6.70
665	-25.00	17.12	5.88	24.21	34.69	6.80
675	-25.00	17.12	11.11	23.42	36.00	6.79
685	-3.03	17.40	-5.88	24.21	34.00	6.70
695	2.86	16.90	-6.67	25.76	30.00	6.48
705	0.00	17.15	-25.00	24.21	32.00	6.60
715	-18.92	16.14	-23.08	26.99	26.00	6.20
725	-8.57	16.84	-33.33	24.34	30.00	6.48
735	-37.50	16.39	-11.11	23.42	36.00	6.79
745	-26.67	17.60	-10.00	22.25	40.00	6.93
755	-15.15	17.21	17.65	23.87	34.00	6.70
765	-12.50	17.54	11.11	23.42	36.00	6.79
775	0.00	17.15	12.50	24.80	32.00	6.60
785	8.57	16.84	6.67	25.76	30.00	6.48
795	5.88	17.12	0.00	25.00	32.00	6.60
805	6.25	17.64	-11.11	23.42	36.00	6.79
815	16.13	17.73	-15.79	22.65	38.00	6.86
825	12.50	17.54	-22.22	22.98	36.00	6.79
835	-3.03	17.40	-17.65	23.87	34.00	6.70
845	-17.65	16.88	-37.50	23.18	32.00	6.60
855	-16.67	16.43	-28.57	25.61	28.00	6.35
865	-29.73	15.70	-7.69	27.65	26.00	6.20
875	-48.57	14.78	20.00	25.30	30.00	6.48
885	-35.29	16.05	12.50	24.80	32.00	6.60
895	-14.29	16.73	33.33	24.34	30.00	6.48
905	-3.03	17.40	41.18	22.10	34.00	6.70
915	-3.03	17.40	52.94	20.58	34.00	6.70
925	-12.50	17.54	33.33	22.22	36.00	6.79
935	-23.53	16.67	37.50	23.18	32.00	6.60
945	-33.33	16.41	29.41	23.18	34.00	6.70
955	-41.18	15.63	12.50	24.80	32.00	6.60
965	-17.65	16.88	-25.00	24.21	32.00	6.60
975	5.56	16.64	-14.29	26.45	28.00	6.35
985	20.00	16.56	-20.00	25.30	30.00	6.48
995	13.51	16.29	-7.69	27.65	26.00	6.20
1005	21.05	15.86	0.00	28.87	24.00	6.04
1015	17.95	15.75	27.27	29.01	22.00	5.86
1025	17.95	15.75	27.27	29.01	22.00	5.86
1035	14.29	16.73	33.33	24.34	30.00	6.48
1045	2.86	16.90	33.33	24.34	30.00	6.48
1055	-9.09	17.34	5.88	24.21	34.00	6.70
1065	-13.33	18.09	10.00	22.25	40.00	6.93
1075	-29.03	17.19	5.26	22.91	38.00	6.86
1085	-37.14	15.69	-20.00	25.30	30.00	6.48
1095	-27.27	16.75	-5.88	24.21	34.00	6.70
1105	-15.15	17.21	5.88	24.21	34.00	6.70
1115	-15.15	17.21	5.88	24.21	34.00	6.70
1125	-18.75	17.36	0.00	23.57	36.00	6.79
1135	-12.50	17.54	22.22	22.98	36.00	6.79
1145	-15.15	17.21	5.88	24.21	34.00	6.70
1155	-27.27	16.75	-5.88	24.21	34.00	6.70
1165	-25.71	16.33	-20.00	25.30	30.00	6.48
1175	-31.43	16.05	-20.00	25.30	30.00	6.48
1185	-18.75	17.36	-22.22	22.98	36.00	6.79

Appendix F—continued.

Pos(bp)	(A-T)/(A+T)	SD(A-T)	(C-G)/(C+G)	SD(C-G)	(G+C)/(A+T+C+G)%	SD(%G+C)
1195	0.00	18.26	-10.00	22.25	40.00	6.93
1205	0.00	18.26	-10.00	22.25	40.00	6.93
1215	-3.23	17.95	-5.26	22.91	38.00	6.86
1225	12.50	17.54	0.00	23.57	36.00	6.79
1235	-3.03	17.40	5.88	24.21	34.00	6.70
1245	-15.15	17.21	-17.65	23.87	34.00	6.70
1255	-22.58	17.50	-5.26	22.91	38.00	6.86
1265	-6.25	17.64	0.00	23.57	36.00	6.79
1275	0.00	18.26	0.00	22.36	40.00	6.93
1285	0.00	17.68	0.00	23.57	36.00	6.79
1295	9.09	17.34	5.88	24.21	34.00	6.70
1305	15.15	17.21	-17.65	23.87	34.00	6.70
1315	3.23	17.95	-26.32	22.13	38.00	6.86
1325	-23.53	16.67	-37.50	23.18	32.00	6.60
1335	3.03	17.40	-52.94	20.58	34.00	6.70
1345	-15.15	17.21	-29.41	23.18	34.00	6.70
1355	-18.92	16.14	7.69	27.65	26.00	6.20
1365	-8.11	16.39	23.08	26.99	26.00	6.20
1375	-3.03	17.40	50.00	21.65	32.65	6.70
1385	-21.21	17.01	62.50	19.52	32.65	6.70
1395	3.03	17.40	37.50	23.18	32.65	6.70
1405	9.68	17.88	11.11	23.42	36.73	6.89

Appendix G
Combined DNA Matrix

Appendix G—continued.

```
                                 |<-Start ITS
{                                          10        20        30        40        50}
{                                           .         .         .         .         .}
Restrepiella_291                 TCGAGACCGAAAAAA----AT-CGAG-TGATT-CGGAGA-ACCCGTGATC   {42}
Pluer.racemiflora_140            TCGAGACCGAAAC----ATAT-CGAG-CGATT-CGGAGA-ACCCGTGAAC   {42}
Ponera.striata_197               TCGAGACCGAAAT--ATATAT-CGAG-CGATT-CGGAGA-ACCCGTGAAC   {44}
Isochilis.major_279              TCGAGACCGAAAA----ACAT-CGAG-CGATT-CGGAGA-ACCCGTGAAC   {42}
Epi.ibaguense_60                 TCGAGACCGAAATATATATAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {46}
Epi.conopseum_244                TCGAGACCGAAATA--TATAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {44}
Nidema.boothii_192               TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
S._pulchella_W208                TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
H.imbricata_283                  TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
Reichenbachanthus_W107           TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
Hexadesmia_K336                  TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
Acrorchis_399                    TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
Jacquiniella_313                 TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
Hagsatera_229                    TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
Homalopetalum_234                TCGAGACCGAAAAA----TAT-CGAA-TGATTT-GGAGA-ACTCGTGAAT   {42}
Meiracyllium_trinas_129          TCGAGACCGAAATA----TGT-CGAG-CGATT-CGGAGA-ACTCGTGAAC   {42}
Psy.mcconnelliae_W53R            TCGAGACCGAA-TA--TATAT-CGAG-CGATT-CGGAGA-AC-CGTGAAT   {42}
Psy.krugii_62                    TCGAGACCGAAATA--TAT-T--GAG-CGATT-CGGAGA-AC-CGTGAAT   {41}
Brough.nigrilensis_152           TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACCCGTGAAT   {42}
Tetramica.elegans_160            TCGAGACCGAAATA----TAT-CGAG-CGATTT-GGAGA-ACCCGTGAAT   {42}
Domingoa_225                     TCGAGACCGAAATA----TAT-CGAA-CGATT-CGGAGA-ACCCGTGAAT   {42}
Cattleyopsis_251                 TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACCCGTGAAT   {42}
Brassav.cucullata_130            TCGAGAC-GAAACA--TACAT-CGAG-CGATT-CGGAGA-ACCCGTGAAT   {43}
L.rubescens_w284                 TCGAGAC-GAAATA---ATAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {42}
Myrmecophila_281                 TCGAGACCGAATTA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
C.dowiana_282                    TCGAGACCGAAATAT---TWT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {43}
Rhy.glauca_N134                  TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
C.forbesii_59                    TCGAGACCGAAAAAA---CAT-CGAG-CGATT-CGGAGA-ACCCGTGAAT   {43}
Soph.cernua_145                  TCGAGACCGAAACA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
L.purpurata_84                   TCGAGACCGAAATA----CAT-CGAG-CGATT-CGGAGA-ACCCGTGAAT   {42}
Schm.splendida_280               TCGAGACCGAAATA----TAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.citrina_54                     TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.mariae_56                      TCGAGACCGAAATA----TAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.mariae_87                      TCGAGACCGAAATA----TAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {42}
D.polybulbon_61                  TCGAGATCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
D.polybulbon_94                  TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.adenocaula_12                  TCGAGACCGAAATA----TAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.bractescens_21                 TCGAGAC-GAAATA----CAT-CGAGACGATT-CGGAGA-ACTCGTGAAT   {42}
E.aromatica_02                   TCGAGACCGAAAAA----TAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.cordigera_24                   TCGAGACCGAAATA----TAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.tampensis_27                   TCGAGACCGAAATA----TAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.tampensis_alba_23              TCGAGACCGAAATA----TAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.dichroma_74                    TCGAGACCGAAATA--TATAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {44}
E.diurna_09                      TCGAGACCGAAATA----TAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.asperula_65                    TCGAGACCGAA-TA--TATAT-CGAA-CGATT-CGGAGA-A-TCGTGAAT   {42}
E.candollei_29                   TCGAGACCGAA-TAT---CAT-CGAA-CGATT-CGGAGGAACTCGTGA-T   {42}
E.randii_50                      TCGAGACCGAAATA----TAT-CGAA-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.kienastii_235                  TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
P.chimborazoensis_51             TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACCCGTGAAT   {42}
P.fragrans_172                   TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACCCGTGAAT   {42}
P.aemula_17                      TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACCCGTGAAT   {42}
P.cochleata_31                   TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
P.pygmaea_81                     TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-A-TCGTGAAT   {41}
P.pseudopygmaea_205              TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
P.vitellina_57                   TCGAGACCGGAATA----TAT-CGAG-CGATTTGGGAGAAACTCGTGAAT   {44}
P.glauca_176                     TCGAGACCGAAATA----TAT-CGAG-CGATTT-GGAGA-ACTCGTGAAT   {42}
P.ionocentra_46                  TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
P.prismatocarpa_19               TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
P.ochracea_95                    TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGACA-ACTCGTGAAT   {42}
P.cretacea_230                   TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.luteorosea_178                 TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACCAGTGAAT   {42}
E.luteorosea_173                 TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-ACCAGTGAAT   {42}
E.subulatifolia_128              TCGAGACCGAAAAA----TAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {42}
E.subulatifolia_174              TCGAGACCGAAAAA---ATAT-CGAG-CGATT-CGGAGA-ACTCGTGAAT   {43}
E.cyanocolumna_1001              TCGAGACCGAAATA----TAT-CGAG-CGATT-CGGAGA-AC-CGTGAAT   {41}
E.tenuissima_143                 TCGAGACCGAAATA----TAT-CGAG-CGATC-CGGAGA-ACTCGTGAAT   {42}
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Appendix G—continued.

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{                                            60         70         80         90        100}
{                                             .          .          .          .          .}
Restrepiella_291                 --AAGCGGCGGCA-CCGACCGTCGCAC--AACAGT-CATCCC-CGTC--G    {83}
Pluer.racemiflora_140            --GAGCGACGGCCGCCCGCCGTCGCGT--AACGG-CCAACCC-GGTC--G    {84}
Ponera.striata_197               --GAGCGACGGCGGCC-GCCGTCGCGG--AACAG-CCGTCCC-GTTC--G    {85}
Isochilis.major_279              --GAGCGGCGGCGGCCGT-CGTCGCCG--GACAG-CCGTCCC-GGTC--G    {83}
Epi.ibaguense_60                 --GTGCGGCGGCATTTGG-CGTCGCGG--AACAG-CCGTCTC-GATCC--    {87}
Epi.conopseum_244                --ACGCGGCGGCAGCAGG-CGTCGCGG--AACAG-CCGTCCC-GATCC--    {85}
Nidema.boothii_192               --GTGCGGCGGCATCTGG-CGTCGCGG--AACAG-CCGTCTC-GATCC--    {83}
S._pulchella_W208                --GTGCGGCGGCAGATGT-CGTCGCGG--AACAG-CCATCCC-GATCC--    {83}
H.imbricata_283                  --GTGCGGCGGCAGCTGT-CGTCGCGG--AACAG-CCATCCC-GATCC--    {83}
Reichenbachanthus_W107           --GTGCGGCGGCAGCTGT-CGTCGCGG--AACAG-CCATCCC-GATCC--    {83}
Hexadesmia_K336                  --GTGCGGCGGCAGATGT-CGTCGCGG--AACAG-CCATCCC-GATCC--    {83}
Acrorchis_399                    --GTGCGGCGGCAGTTGG-CGTCGCGG--AACAG-CCATCCC-GATCC--    {83}
Jacquiniella_313                 --GTGCGGCGGCAGTTGG-CGTCGCAG--AATAG-CCATCCC-GATCCC-    {84}
Hagsatera_229                    --GTGCGGCGGCAACTGG-CGTCGCGG--AACAGTC-GTCCC-GATCC--    {83}
Homalopetalum_234                --GTGCGGCGACAGCTTG-CGTCGCGG--AAC-GTCCGCCCC-GATCCC-    {84}
Meiracyllium_trinas_129          --GTGCGGCGGCAGCTGG-CGTCGCGTAAAACAG-CCACCCC-GATCC--    {85}
Psy.mcconnelliae_W53R            --GTGCGGCGGCAGCTTG-CGTCGCAG--AACAG-CCGTCCC-GATCC--    {83}
Psy.krugii_62                    --GTGCGGCGGCAGCTTG-CGTCGCAG--AACAG-CCGTCCC-GATCC--    {82}
Brough.nigrilensis_152           --GTGCGGCGGCAGCTGG-CGTCGCGA--AACAG-CCGTCCC-GATCC--    {83}
Tetramica.elegans_160            --GTGCGGCGGCAGGTGG-CGTCGCGG--AACAG-CCGTCTT-GATCC--    {83}
Domingoa_225                     --GTGCGGCGGCAGCTGG-CGTCGCGG--AACAG-CCGTCCC-GATCCC-    {84}
Cattleyopsis_251                 --GTGCGGCGGCAGCTGG-CGTCGCGG--AGCAG-CCGTCCC-GACCC--    {83}
Brassav.cucullata_130            --GCGCGGCGGCAGCTGG-CGTCGCGG--AACAG-CCGTCCC-GATCCC-    {85}
L.rubescens_W284                 --GCGCGGCGGCAGCTGG-CGTCGCGG--AACAG-CCGTCCC-GATCC--    {83}
Myrmecophila_281                 --GTGCGGCGGCAGC-GG-CGTCGCGG--AACAG-CCGTCCC-GATCCC-    {83}
C.dowiana_282                    --GCGCGGCGGCAGCTGG-CGTCGCGG--AACAG-C-GTCCC-GATCCC-    {84}
Rhy.glauca_N134                  --GTGCGGCGGCAGCTGC-CGTCCCGG--AACAG-CCGTCCC-GATCC--    {83}
C.forbesii_59                    --GTGC-----------C-CGCCGCGG--AACAG-CCGTCCC-GATCCC-    {74}
Soph.cernua_145                  --GCGCGGCGGCGGCTGG-CGTCGCGG--AACAG-CCGTCCC-GATCC--    {83}
L.purpurata_84                   GCGCGCGGCGGCAGCTGG-CGTCGCGGG-AACAG-CCGTCCC-GATCC--    {86}
Schm.splendida_280               --GTGCGGCGGCATCTGG-CGTCGCGG--AACAG-CCGTCCC-GATCC--    {83}
E.citrina_54                     --GTGCGGCGACAGCTGG-CGTCGCGG--AACAG-CCGTCAA-GATCC--    {83}
E.mariae_56                      --GTGCGGCGACAGCTGG-CGTCGCGG--AACAG-CCGTCAA-GATCC--    {83}
E.mariae_87                      --GTGCGGCGACAGCTGG-CGTCGCGT--AACAG-CCGTCAA-GATCC--    {83}
D.polybulbon_61                  --GTGCGGCGGCATCTGG-CGTCGCGG--AACAG-CCGTCCC-GATCC--    {83}
D.polybulbon_94                  --GTGCGGCGGCATCTGG-CGTCGCGG--AACAG-CCGTCCC-GATCC--    {83}
E.adenocaula_12                  --GCGCGGCGGCAGCTGG-CGTCGCGG--AACAG-CCGTCCC-GATCC--    {83}
E.bractescens_21                 --GTGCGGCGTCAGCTGG-CGTCGCGG--AACAG-CCGTCCC-GATCC--    {83}
E.aromatica_02                   --GTGCGGCGGCAGCTGG-CGTCGCGG--AACAA-CCGTCCC-GATCC--    {83}
E.cordigera_24                   --GTGCGGCGGCAGCTGG-CGTCGCGG--AACAA-CCGTCCC-GATCC--    {83}
E.tampensis_27                   --GTGCGGCGTCAGCTGG-CGTCGCGG--AACAG-CCGTCCC-GATCC--    {83}
E.tampensis_alba_23              --GTGCGGCGGCAGCTGG-CGTCGCGG--AACAG-CCGTCCC-GATCC--    {83}
E.dichroma_74                    --GTGCGGCGGCAGCTGG-CGTCGCGG--AACAA-CCGTCCC-GATCC--    {85}
E.diurna_09                      --GTGCGGCGGCAGCTGG-CGTCGCGG--AACAA-CCGTCCC-GATCC--    {83}
E.asperula_65                    --GTGCGGCGGCAGCTGG-CGTCGCGG--AACAA-CCGTCCC-GATCC--    {83}
E.candollei_29                   -CGTGCGGCGGCAGCTGG-CGTCGCGG--AACAA-CCGTCCC-GATCC--    {84}
E.randii_50                      --GTGCGGCGGCAGCTGG-CGTCGCGG--AACAA-CCGTCCC-GATCC--    {83}
E.kienastii_235                  --GCGCGGCGGCAGCAGT-CGTCGCGG--AACAG-CCGTCCC-GATCCC-    {84}
P.chimborazoensis_51             --GTGCGGCGGCAGGCGG-CGCCGCGG--AACAG-CCGTCCCCGATC-A-    {84}
P.fragrans_172                   --GTGCGGCGGCAGGCGG-CGCCGCGG-AAACAG-CCGTCCCCGATC-A-    {85}
P.aemula_17                      --GTGCGGCGGCAGGCGG-CGCCGCGG--AACAG-CCGTCCCCGATC-A-    {84}
P.cochleata_31                   --GCGCGGCGGCAGGCGG-CGCCGCGG--AACA-CCCGTCCCCGATC-A-    {84}
P.pygmaea_81                     --GCGCGGCGGCATCTGG-CGCTGCGG--AACAG-CCGTCCC-GATCC--    {82}
P.pseudopygmaea_205              --GCGCGGCGGCATCTGG-CGCCGCGG--AACAG-CCGTCCC-GATCCC-    {84}
P.vitellina_57                   --GCGCGGCGCCAGCTGG-CGCCGCGG--AACAG-CCGTCCT-GATCCC-    {86}
P.glauca_176                     --GCGCGGCGCCGGCTGG-CGCCGCGG--AACAG-CCGTCCC-GATCCC-    {84}
P.ionocentra_46                  --GCGCGGCGGCAGCTGT-CGCCGCGG--AACAG-CCGTCCC-GATCC--    {83}
P.prismatocarpa_19               --GTGCGGCGGCAGCTGT-CGCCGCGG-AAACAG-CCGTCCC-GATCC--    {84}
P.ochracea_95                    --GTGCGGCGGCAGCTGG-CGCCGCAG--AACAG-CCGTCCC-GATCC--    {83}
P.cretacea_230                   --GCGCGGCGGCAGCTGG-CGCCGCGG--AACAG-CCGTCCC-GATCC--    {83}
E.luteorosea_178                 --GTGCGGCGTCAGCTGG-CGTCGCGG--AACAG-CCGTCCC-GATC-A-    {83}
E.luteorosea_173                 --GTGCGGCGTCAGCTGG-CGTCGCGG--AACAG-CCGTCCC-GATC-A-    {83}
E.subulatifolia_128              --GTGCGACGGCAGCTGC-CGTCGTAG--AACA-TCCGTCCC-GGGCC--    {83}
E.subulatifolia_174              --GTGCGACGGCAGCTGC-CGTCGTAG--AACA-TCCGTCCC-GGGCC--    {84}
E.cyanocolumna_1001              --GCGCGGCGGCATCTGG-CGTCGCGA--AACAG-CCGTCCC-GATCCC-    {83}
E.tenuissima_143                 --GCGCGGCGGCAGCTGG-CGTCGCGA--AACAG-CCGTCCC-GATCCC-    {84}
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Appendix G—continued.

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{                                          110       120       130       140       150}
{                                            .         .         .         .         .}
Restrepiella_291             TCGGTCTCGTCTC--TATC------------GGGGTCACGATGA-GGGGT    {118}
Pluer.racemiflora_140        TCGGCCTCACC--------------------GGGGCCACGACGA-GGGGC    {113}
Ponera.striata_197           T-GGCCTCATCTCTCCCTAC-----GGGTGGTGGGCCACGATGCA-GGGC    {128}
Isochilis.major_279          T-GGCCTCGTCTCC-CCGTCGTGGGGGGTGGGGGGCCCACRACGAAGGGC    {131}
Epi.ibaguense_60             T-GGCCTCATCTT--CATC----------GGGGGGCCATGGTGA-GGGGC    {123}
Epi.conopseum_244            T-GGACTCATCTT--CAT---------GGGGGGGGCCATGGTGAAGGGGC    {123}
Nidema.boothii_192           T-GGCCTCATCTT--CACC----------GGGGGGCCACGGTGA-GGGGC    {119}
S._pulchella_W208            T-GGCCTCATCTT--CACC----------GGGGGGCCACGGTGA-GGGGC    {119}
H.imbricata_283              T-GGCCTCATCTT--CACC----------GGGGGGCCACGGTGA-GGGGC    {119}
Reichenbachanthus_W107       T-GGCCTCATCTT--CACC----------GGGGGACACGGTGA-GGGGC    {119}
Hexadesmia_K336              T-GGCCTCATCTT--CACC---------GGGGGGGCCACGGTGAAGGGGC    {121}
Acrorchis_399                T-GGCCTCATCTT--CACT----------GGGGGGCCACGGCGA-GGGGC    {119}
Jacquiniella_313             --GGCCTCATCTT--CACC----------GGGGGGCCGCGGTGA-GGGGC    {119}
Hagsatera_229                T-GGCCTCATCTT--CAAC----------GGGGGGCCACGGTGAA-GGGC    {119}
Homalopetalum_234            --GGCCTCATCTT--CATC------GAGGGGGGGGCATGGATAC--GGGC    {122}
Meiracyllium_trinas_129      T-GGCCTCATCTT--CAGC---------GGGGGGGCCACGGCGAA-GGGC    {122}
Psy.mcconnelliae_W53R        T-GGCCTCATCTT--CAC----------GGGGGGGCCATGGTGA-GGGGC    {119}
Psy.krugii_62                T-GGCCTCATCTT--CAC----------GGGGGGGCCATGGTGA-GGGGC    {118}
Brough.nigrilensis_152       T-GGCCTCATCTT--CACC---------GGTGGGGCCACGGTGA-GGGGC    {120}
Tetramica.elegans_160        T-GGCCTCATCTT--CACC---------GGGGGGGCCACGGTGA-GGGGC    {120}
Domingoa_225                 --GGCCTCCTCTT--CAC----------GGGGGGGCCACGGTGAA-GGGC    {119}
Cattleyopsis_251             TTTGCCTCATCTT--CACC---------GGTGGGGCCACGGTGA-GGGGC    {121}
Brassav.cucullata_130        --GGCCTCATCTT--CACC----------GGGGGGCCACGGTGA-GGGGC    {120}
L.rubescens_w284             T-GGCCTCATCTT--CACC----------GGGGGGCCACGGCGAA-GGGC    {119}
Myrmecophila_281             T-GGCCTCGTCTT--CACC---------GGGGGGGCCACGGTGAA-GGGC    {120}
C.dowiana_282                --GGCCTCATCTT--CAC-----------GGGGGGCCACGGTCAA--GGC    {117}
Rhy.glauca_N134              T-GGCCTCATCTT--CACC--------GGGAGGGGCCACGGTGAC-GGGC    {122}
C.forbesii_59                --GGCCTCGTCCT--CAC----------GGGGGGGCCACGGTGAA-GGGC    {109}
Soph.cernua_145              T-GGCCTCATCTT--CACC----------GGGGGGCCACGGTGAA-GGGC    {119}
L.purpurata_84               A-GGCCTCATCTT--CACC----------GGGGGGCCACGGCGAA-GGGC    {122}
Schm.splendida_280           G-GGCCTCATCTT--CATT----------GGGGGGCCACGGCGAA-GGGC    {119}
E.citrina_54                 T-GGCCTCGTCTT--GACC---------GGGGGGGCCACGGTGA-GGGGC    {120}
E.mariae_56                  T-GGCCTCGTCTT--GACC---------GGGGGGGCCACGGTGA-GGGGC    {120}
E.mariae_87                  T-GGCCTCGTCTT--GACC---------GGGGGGGCCACGGTGA-GGGGC    {120}
D.polybulbon_61              T-GGCCTCATCTT--CACC----------GGGGGGCCATGGTGA-GGGGC    {119}
D.polybulbon_94              T-GGCCTCATCTT--CACC----------GGGGGGCCATGGTGA-GGGGC    {119}
E.adenocaula_12              T-GGCCTCGTCTT--CAC-----------GGGGGGCCATGGCGA-GGGGC    {118}
E.bractescens_21             T-GGCCTCGTCTT--CAC-----------GGGGGGCCATGGGGA-GGGCC    {118}
E.aromatica_02               T-GGCCTCGTCTT--CAC----------GGGGGGGCCATGGCGA-GGGGC    {119}
E.cordigera_24               T-GGCCTCGTCTT--CA------------GGGGGGCCATGGCGA-GGGGC    {117}
E.tampensis_27               T-GGCCTCGTCTT--CAC-----------GGGGGGCCATGGCGA-GGGGC    {118}
E.tampensis_alba_23          T-GGCCTCGTCTT--CAC-----------GGGGGGCCATGGCGA-GGGGC    {118}
E.dichroma_74                T-GGCCTCGTCTT--CAC-----------GGGGGGCCATGGCGA-GGGGC    {120}
E.diurna_09                  T-GGCCTCGTCTT--CAC-----------GGGGGGCCATGGCGA-GGGGC    {118}
E.asperula_65                T-GGCCTCGTCTT--CAC-----------GGGGGGCCATGGCGA-GGGGC    {118}
E.candollei_29               T-GGCCTCGTCTT--CAC----------GGGGGGGCCATGGCGA-GGGGC    {120}
E.randii_50                  T-GGCCTCGTCTT--CAC-----------GGGGGGCCATGGCGA-GGGGC    {118}
E.kienastii_235              --GGCCCCATCTT--CACC---------GGGGGGGCCACGGTGG-CGGGC    {120}
P.chimborazoensis_51         T-GGCCTCATCTT--CACC---------GGGGGGGCCACGGCGA-GGGGC    {121}
P.fragrans_172               T-GGCCTCATCTT--CACC----------GGGGGGCCACGGCGG-GGGGT    {121}
P.aemula_17                  T-GGCCTCATCTT--CACC----------GGGGGGCCACGGCGA-GGGGC    {120}
P.cochleata_31               T-GGCCTCATCTT--CAC----------GGGGGGGCCACGGCGA-GGGGC    {120}
P.pygmaea_81                 T-GGCCTCATCTT--CACC----------GGGGGGCCACGGCGA-GGGGC    {118}
P.pseudopygmaea_205          --GGCCTCATCTT--CACG----------GGGGGGCCACGGCGAAGGGGC    {120}
P.vitellina_57               --GGCCTCATCTT--CACC---------GGGGGGGCCAGGCGA-GGGGG    {122}
P.glauca_176                 --GGCCTCATCTT--CATC----------GGGGGGCCACGTGGA-GGGGC    {119}
P.ionocentra_46              T-GGCCTCATCTT--CACC----------GGGGGGCCACGGCGA-GGGGC    {119}
P.prismatocarpa_19           T-GGCCTCATCTT--CATC----------GGGGGGCCACGGCGA-GGGGC    {120}
P.ochracea_95                T-GGCCTCATCTT--CATC----------GGGGGGCCACGGCGA-GGGGC    {119}
P.cretacea_230               T-GGCCTCATCTT--CACC----------GGGGGGCCACGGCGA-GGGGC    {119}
E.luteorosea_178             T-GGCCTCATCTT--CAAC----------GGGGGGC-ACGGTGA-GGGGC    {118}
E.luteorosea_173             T-GGCCTCATCTT--CAAC----------GGGGGGC-ACGGTGA-GGGGC    {118}
E.subulatifolia_128          T-GGCCTGATCCTG-CAT----------GGGGGGGCCATGGTGAAGGGGC    {121}
E.subulatifolia_174          T-GGCCTGATCCTG-CAT----------GGGGGGGCCATGGTGAAGGGGC    {122}
E.cyanocolumna_1001          --GGCCTCGCCTT--CACC----------GGGGGGCCACGGTGAAGGG-C    {118}
E.tenuissima_143             --GGCCTCACCTC--CACC----------GGGGGGCCGCGGCGA-GGGGC    {119}
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Appendix G—continued.

{	160 170 180 190 200}	
{	. . . . .}	
Restrepiella_291	GGCTGAAAA--TC-AAACCGGCGCAGCTACGCGCCAAGGG-AATACAAAG	{164}
Pluer.racemiflora_140	GGCCACAA--CT-AAAACCGGCGCAGCTACGCGCTAAGGG-AATACGAAT	{159}
Ponera.striata_197	GGACGAAA--CTC-AAACCGGCGCAGCTGCGCGCCAAGGG-CATATCGAA	{174}
Isochilis.major_279	GGATGAAAA-CTC-AAACCGGCGCAGCCACGCGCCAAGGG-AATATCGAA	{178}
Epi.ibaguense_60	GGATGAAAAACTC-AAACCGGCGCAGTTACGCGCCAAGGAAAATATCGAA	{172}
Epi.conopseum_244	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATTGAA	{169}
Nidema.boothii_192	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
S._pulchella_W208	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
H.imbricata_283	GGATGAAA--CAC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
Reichenbachanthus_W107	GGATGAAA--CAC-AAATCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
Hexadesmia_K336	GAATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGA-AATATCGAA	{167}
Acrorchis_399	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGT-AATATCGAA	{165}
Jacquiniella_313	GGATGAAA--CCA-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
Hagsatera_229	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
Homalopetalum_234	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCAGA	{168}
Meiracyllium_trinas_129	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{168}
Psy.mcconnelliae_W53R	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
Psy.krugii_62	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{164}
Brough.nigrilensis_152	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGA-AAAATCGAA	{166}
Tetramica.elegans_160	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAG	{166}
Domingoa_225	GGATGAAA--CAC-AAACCGGCGCAGTTACGCGCCAAGGG-AATGTTAAA	{165}
Cattleyopsis_251	GGATGAAAAACTC-AAACCGGCGCAGTTACGCGCCAAGGG-AAAATCGAA	{169}
Brassav.cucullata_130	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGA-AATTTCGAA	{166}
L.rubescens_w284	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
Myrmecophila_281	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{166}
C.dowiana_282	AGATTATA--CTC-AAACCGGCGCACTGACGCGCCAAG---AATATCGGA	{161}
Rhy.glauca_N134	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{168}
C.forbesii_59	GGATGAAA--CTC-AAACCGGCGCA?TTACGCGCCAAGG--AATATCGAA	{154}
Soph.cernua_145	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGGAAATATCGAA	{166}
L.purpurata_84	GGATGAAAA-CTC-AAACCGGCGCAGCGACGCGCCAAGGGAAATATGGAA	{170}
Schm.splendida_280	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGGAAATATCGAA	{166}
E.citrina_54	GGATGAAA--CAC-CAACGGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{166}
E.mariae_56	GGATGAAA--CAC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{166}
E.mariae_87	GGATGAAA--CAC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{166}
D.polybulbon_61	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
D.polybulbon_94	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
E.adenocaula_12	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATGGAA	{164}
E.bractescens_21	GGATGAAA--CTC-AAACCGGCGCAGTCACGCGTCAAGGG-AATATCGAA	{164}
E.aromatica_02	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
E.cordigera_24	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{163}
E.tampensis_27	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{164}
E.tampensis_alba_23	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{164}
E.dichroma_74	GGAAGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCAAA	{166}
E.diurna_09	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{164}
E.asperula_65	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{164}
E.candollei_29	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{166}
E.randii_50	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{164}
E.kienastii_235	GGATGAAA--CTCAAAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{167}
P.chimborazoensis_51	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATAACGAA	{167}
P.fragrans_172	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{167}
P.aemula_17	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{166}
P.cochleata_31	GGGTGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{166}
P.pygmaea_81	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{164}
P.pseudopygmaea_205	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{166}
P.vitellina_57	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{168}
P.glauca_176	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
P.ionocentra_46	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
P.prismatocarpa_19	GGATGAAAA-CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{167}
P.ochracea_95	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
P.cretacea_230	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{165}
E.luteorosea_178	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATTGAA	{164}
E.luteorosea_173	GGATGAAA--CTC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATTGAA	{164}
E.subulatifolia_128	GGATGAAAA-CTA-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCAGA	{168}
E.subulatifolia_174	GGATGAAAA-CTA-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCAGA	{169}
E.cyanocolumna_1001	GGATGAAA--CAC-AAACCGGCGCAGTTACGCGCCAAGGG-AATATCGAA	{164}
E.tenuissima_143	GGATGAAA--CTC-AAACCGGCGCAGCTACGCGCCAAGGG-AATATCGAA	{165}

Appendix G—continued.

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{                                  210       220       230       240       250}
{                                    .         .         .         .         .}
Restrepiella_291            AGA-CACGAG-CCCTGCA-TA-GGG-TTCGGTGGCGT--GGA-GTGC--T   {204}
Pluer.racemiflora_140       GGA-CACGAG-CCC-GCA-TC-GGG-CTCGGTGGCGT--GGA-GTGC--T   {198}
Ponera.striata_197          ATA-CACGAG-CCCCGCA-TC-GGG-TCTCGTGGCGT--GGG-GTGC--T   {214}
Isochilis.major_279         TGA-CACGAG-CCCTGCA-TC-TGG-TTTCGTGGCGT--GGG-GTGC--T   {218}
Epi.ibaguense_60            AAA-CATGAG-CCCTGCA-TC-GGG-TTTTATGGCAT--GGG-GTGT--T   {212}
Epi.conopseum_244           AAA-TACGAG-CCCTGTA-TC-GGG-TTTGATGGCAT--GGA-GTGC--T   {209}
Nidema.boothii_192          AAA-CACGAG-CCCTACA-CC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {205}
S._pulchella_W208           AAA-CACGAG-CCCTACA-CC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {205}
H.imbricata_283             AAA-CACGAA-CCCTACA-CC-GGG-TTTTGTGGAGT--GGA-GTGC--T   {205}
Reichenbachanthus_W107      AAA-CACGAA-CCCTGCA-CC-GGG-TTTTGTGGCGT--GGA-GTGC--T   {205}
Hexadesmia_K336             AAA-CACGAG-CCCTACA-CC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {207}
Acrorchis_399               AAA-CGCGAG-ACCTACA-TC-GGG-TATTGTGGCAT--GGA-GTGC--T   {205}
Jacquiniella_313            AAA-CACGAG-CCCTACA-CC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {205}
Hagsatera_229               AAA-CACGAG-CCCTATA-TC-GGG-TTCTGTGGCAT--GGA-GTGC--T   {205}
Homalopetalum_234           AAA-CACGAG-CCCTACA-TC-GGG-TATTGTGGCAT--GGA-GTGT--T   {208}
Meiracyllium_trinas_129     AAG-CATGAG-CCCTATA-CT-GGG-TTTTATGGCAT--GGA-GTGC--T   {208}
Psy.mcconnelliae_W53R       AAA-CACGAG-CCCTGCA-TA-GGG-TTTTGTGGTAT--GGG-GTGC--T   {205}
Psy.krugii_62               AAA-CACGAG-CCCTGCA-TA-GGG-TTTTGTGGTAT--GGG-GTGC--T   {204}
Brough.nigrilensis_152      AAA-CACGAG-CCCTGCA-TA-GGGCTTTTGTGGCAT--GGA-GTGC--T   {207}
Tetramica.elegans_160       AAA-TATGAG-CCCTGCA-TC-GGG-TTCTGTGGCAT--GGA-GTGC--T   {206}
Domingoa_225                AAA-CACGAG-CCTCGTA-CC-GGGCT-TTGTGGCAT--GGA-GTGTGCT   {207}
Cattleyopsis_251            AAA-CACGAG-CCCTGCA-TA-GGGCATTCGTGGCAT--GGA-GTGC--T   {210}
Brassav.cucullata_130       AAA-CACGAG-CCCTGCA-TC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {206}
L.rubescens_w284            AAA-CACGA--CCTGGAAACC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {205}
Myrmecophila_281            AAA-CACGAG-CCCTGTA-CC-GGG-TTTTGTGGCAT--GGC-GTGC--T   {206}
C.dowiana_282               AGA-CACGAG-CCCTGCA-TC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {201}
Rhy.glauca_N134             AAA-CACGAG-CCCTGCA-TC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {208}
C.forbesii_59               AAA-CACGAG-CCCTGCA-TC-GGGGCTTCGTGGCAT--GGA-GTGC--T   {195}
Soph.cernua_145             AAA-CAC-AGGCCCT--A-CCAGGG-CTTTGTGGCAT--GGA-GTGC--T   {205}
L.purpurata_84              AAA-CACGAGGCCC-ACA-CC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {210}
Schm.splendida_280          AAA-CACGAG-CCCTTCA-TC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {206}
E.citrina_54                AAA-CACGAG-CCCTACA-CT-GGG-TTTTGTGGCAT--GGA-GTGT--T   {206}
E.mariae_56                 AAA-CACGAG-CCCTACA-CT-GGGCTTTTGTGGCAT--GGAAGTGT--T   {208}
E.mariae_87                 AAA-CACGAG-CCCTACA-CT-GGGCTTTTGTGGCAT--GGAAGTGT--T   {208}
D.polybulbon_61             AAA-CACGAG-CCCTACA-TC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {205}
D.polybulbon_94             AAA-CACGAG-CCCTACA-TC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {205}
E.adenocaula_12             AAA-CACGAG-CCCCACG-CC-GG--TTCTGTGGCAT--GGA-GTGC--T   {203}
E.bractescens_21            AAA-CACGAG-CCCCGCA-TC-GGG-TTTTGTGGCAT--GGA-GTGC--C   {204}
E.aromatica_02              AAA-CACGAG-CCCCACA-CC-GGG-TTATGTGGCAT--GGA-GTGC--T   {205}
E.cordigera_24              AAA-CACGAG-CCCCACA-CC-GGG-TTATGTGGCAT--GGA-GTGC--T   {203}
E.tampensis_27              AAA-CACGAG-CCCCACA-CC-GGG-TTCTGTGGCAT--GGA-GTGC--T   {204}
E.tampensis_alba_23         AAA-CACGAG-CCCCACA-CC-GGG-TTCTGTGGCAT--GGA-GTGC--T   {204}
E.dichroma_74               AAA-CACGAG-CCCGACA-CC-GGG-TTCTGTGGCAT--GGA-GTGC--T   {206}
E.diurna_09                 AAA-CACGAG-CCCCACA-CC-GGG-TTATGTGGCAT--GGA-GTGC--T   {204}
E.asperula_65               AAA-CACGAG-CCCCAC--CC-GGG-TTCTGTGGCAT--GGA-GTGC--T   {203}
E.candollei_29              AAA-CACGAG-CCCCACA-CC-GGG-TTATGTGGCAT--GGA-GTGC--T   {206}
E.randii_50                 AAA-CACGAG-CCCCACA-CC-GGG-TTCTGTGGCAT--GGA-GTGC--T   {204}
E.kienastii_235             GAAACACGAG-CCCTACA-CA-GGG-TTTTGTGGCATGTGGA-GTGC--T   {210}
P.chimborazoensis_51        AAA-CACGAG-CCCCACA-CC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {207}
P.fragrans_172              AAA-CACGAG-CCCCACA-CC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {207}
P.aemula_17                 GAA-CACGAG-CCCCACA-TC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {206}
P.cochleata_31              AAA-CACGAG-CCCCACA-CC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {206}
P.pygmaea_81                AAA-CATGAG-CCCTGCA-TC-GGG-TTTTGTGGAAT--GGA-GTGC--T   {204}
P.pseudopygmaea_205         AAA-CACGAG-CCCCACA-CC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {206}
P.vitellina_57              AAA-CACGAG-CCCTGCA-TC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {208}
P.glauca_176                AAA-CACGAG-CCCTGCA-TC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {205}
P.ionocentra_46             AAA-CACGAG-CCCTACA-TC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {205}
P.prismatocarpa_19          AAA-CACGAG-CCCTACA-CC-GGG-TTTTGTGGCAT--GGG-GTGC--T   {207}
P.ochracea_95               AAA-CACGAG-CCCTACA-CC-GGG-CTTTGTGGCAT--GGA-GTGC--T   {205}
P.cretacea_230              AAA-CACGAG-CCCTACA-AC-GGG-TTTTGTGGCAT--GGA-GTGC--T   {205}
E.luteorosea_178            AAA-CACGAG-CCCTGCA-CC-GGG-TCTCGTGGCAT--GGA-GTGC--T   {204}
E.luteorosea_173            AAA-CACGAG-CCCTGCA-CC-GGG-TCTCGTGGCAT--GGA-GTGC--T   {204}
E.subulatifolia_128         AAA-CATGAG-CCTCATA-TC-GGG-CTTTATGGCAT--GGG-GTGC--T   {208}
E.subulatifolia_174         AAA-CATGAG-CCTCATA-TC-GGG-CTTTATGGCAT--GGG-GTGC--T   {209}
E.cyanocolumna_1001         AGA-CACGAR-CCCTACG-CG-GGG-TCTCGTGGCAT--GGA-GTGC--T   {204}
E.tenuissima_143            AAA-CACGAG-CCCTGCA-CC-GGG-TCTTGTGGCAT--GGA-GTGC--T   {205}
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Appendix G—continued.

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{                                         260       270       280       290      300}
{                                          .         .         .         .        .}
Restrepiella_291                  GTGGCACAC--CACAA-GTATC-AAAACGACTCTCGGCAATGGATATCTC   {250}
Pluer.racemiflora_140             GCGGCACAC--CACA-CGGATC-AAAACGACTCTCGGCAATGGATATCTC   {244}
Ponera.striata_197                GTTGCACGC--CATA-TGGATC-GACACGACTCTCGGCAATGGATATCTC   {260}
Isochilis.major_279               GTTGCACGC--CATA-TGGATC-GACACGACTCTCGGCAATGGATATCTC   {264}
Epi.ibaguense_60                  GTTGCACAC--CATG-TGG-TT-GACACGACTCTCGGCAATGGATATCTC   {257}
Epi.conopseum_244                 GTTGCACGC--CATG-CGG-TT-GACATGACTCTCGGCAATGGATATCTC   {254}
Nidema.boothii_192                GTTGCACAC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {250}
S._pulchella_W208                 GTTGCACAC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {250}
H.imbricata_283                   GTTGCACAC--CATA-TGG-TC-GACATGACTCTCGGCAATGGATATCTC   {250}
Reichenbachanthus_W107            GTTGCACAC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {250}
Hexadesmia_K336                   GTTGCACAC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {252}
Acrorchis_399                     GTTGCACAC--CATA-CGG-TC-AACATGACTCTCGGCAATGGATATCTC   {250}
Jacquiniella_313                  GTTGCACAC--CATA-CGG-TC-AACATGACTCTCGGCAATGGATATCTC   {250}
Hagsatera_229                     GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {250}
Homalopetalum_234                 GTTGCACAC--CATA-CGG-TT-GACATGACTCTCGGCAATGGATATCTT   {253}
Meiracyllium_trinas_129           GTTGCACGC--CATA-CGA-TC-AACATGACTCTCGGCAATGGATATCTC   {253}
Psy.mcconnelliae_W53R             GTTGCACAC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {250}
Psy.krugii_62                     GTTGCACAC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {249}
Brough.nigrilensis_152            GTTGCACAC--CACA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {252}
Tetramica.elegans_160             GTTGCGCACGCCATA-CG-TTC-GACATGACTCTCGGCAATGGATATCTC   {253}
Domingoa_225                      GTTGCACGCGCCATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {254}
Cattleyopsis_251                  GTTGCACAC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {255}
Brassav.cucullata_130             GCTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {251}
L.rubescens_w284                  GTCGCACGC--CATA-CGG-TCAGACATGACTCTCGGCAATGGATATCTC   {251}
Myrmecophila_281                  GTTGCGCGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {251}
C.dowiana_282                     GCTGCACGC--CATA-CAG-TC-GACATGACTCTCGGCAATGGATATCTT   {246}
Rhy.glauca_N134                   GCTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {253}
C.forbesii_59                     GCCGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {240}
Soph.cernua_145                   GTTGCACGC--CATA-CGG-TT-GACATGACTCTCGGTAATGGATATCTC   {250}
L.purpurata_84                    GATGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {255}
Schm.splendida_280                GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {251}
E.citrina_54                      GTTGCACGC--CATA-CGG-TC-AACATGACTCTCGGCAATGGATATCTC   {251}
E.mariae_56                       GTTGCACGC-GCATA-CGG-TC--ACATGACTCTCGGCAATGGATATCTC   {253}
E.mariae_87                       GTTGCACGC-GCATA-CGG-TC--ACATGACTCTCGGCAATGGATATCTC   {253}
D.polybulbon_61                   GTTGCACAC--CATA-CGG-TT-GACATGACTCTCGGCAATGGATATCTC   {250}
D.polybulbon_94                   GTTGCACAC--CATA-CGG-TT-GACATGACTCTCGGCAATGGATATCTC   {250}
E.adenocaula_12                   GTCGCACGC--CATA-CG-ATC-GGCATGACTCTCGGCAATGGATATCTC   {248}
E.bractescens_21                  GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {249}
E.aromatica_02                    GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {250}
E.cordigera_24                    GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {248}
E.tampensis_27                    GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {249}
E.tampensis_alba_23               GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {249}
E.dichroma_74                     GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {251}
E.diurna_09                       GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {249}
E.asperula_65                     GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {248}
E.candollei_29                    GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {251}
E.randii_50                       GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {249}
E.kienastii_235                   GTTGCACGC--CACA-GGG-TC-GACATGACTCTCGGCAATGGATATCTC   {255}
P.chimborazoensis_51              GTCGCACGC--CATA-CGG-TC-GACACGACTCTCGGCAATGGATATCTC   {252}
P.fragrans_172                    GTCGCACGC--CATA-CGG-TC-GACACGACTCTCGGCAATGGATATCTC   {252}
P.aemula_17                       GTCGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {251}
P.cochleata_31                    ATTGCACAC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {251}
P.pygmaea_81                      GTCGCACGC--CATA-CGG-TC-AACATGACTCTCGGCAATGGATATCTC   {249}
P.pseudopygmaea_205               GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {251}
P.vitellina_57                    GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGACAATGGATATCTC   {253}
P.glauca_176                      GTTGCACGC--CATA-CGG-AC-GACACGACTCTCGGCAATGGATATCTC   {250}
P.ionocentra_46                   CCTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {250}
P.prismatocarpa_19                CCTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {252}
P.ochracea_95                     ATTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {250}
P.cretacea_230                    GTTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {250}
E.luteorosea_178                  ATTGCACGC--CATACCGG-TC-AACATGACTCTCGGCAATGGATATCTC   {250}
E.luteorosea_173                  ATTGCACGC--CATACCGG-TC-AACATGACTCTCGGCAATGGATATCTC   {250}
E.subulatifolia_128               GCTGCACAC--CAT-TCGG-TT-GGCATGACTCTCGGCAATGGATATCTC   {253}
E.subulatifolia_174               GCTGCACAC--CAT-TCGG-TT-GGCATGACTCTCGGCAATGGATATCTC   {254}
E.cyanocolumna_1001               GTCGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {249}
E.tenuissima_143                  GCTGCACGC--CATA-CGG-TC-GACATGACTCTCGGCAATGGATATCTC   {250}
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Appendix G—continued.

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{                                     310        320        330        340        350}
{                                       .          .          .          .          .}
Restrepiella_291             GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
Pluer.racemiflora_140        GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {294}
Ponera.striata_197           GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {310}
Isochilis.major_279          GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {314}
Epi.ibaguense_60             GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {307}
Epi.conopseum_244            GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {304}
Nidema.boothii_192           GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
S._pulchella_W208            GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
H.imbricata_283              GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
Reichenbachanthus_W107       GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
Hexadesmia_K336              GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {302}
Acrorchis_399                GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
Jacquiniella_313             GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
Hagsatera_229                GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
Homalopetalum_234            GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {303}
Meiracyllium_trinas_129      GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {303}
Psy.mcconnelliae_W53R        GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
Psy.krugii_62                GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {299}
Brough.nigrilensis_152       GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {302}
Tetramica.elegans_160        GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {303}
Domingoa_225                 GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {304}
Cattleyopsis_251             GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {305}
Brassav.cucullata_130        GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {301}
L.rubescens_w284             GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {301}
Myrmecophila_281             GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {301}
C.dowiana_282                GGATCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {296}
Rhy.glauca_N134              GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {303}
C.forbesii_59                GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {290}
Soph.cernua_145              GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
L.purpurata_84               GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {305}
Schm.splendida_280           GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {301}
E.citrina_54                 GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {301}
E.mariae_56                  G-CTCTCGCATCGATGAAGAGCGCAGCGAA-TGCGATACGTG-TGCGA-T   {299}
E.mariae_87                  GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {303}
D.polybulbon_61              GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
D.polybulbon_94              GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
E.adenocaula_12              GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {298}
E.bractescens_21             GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {299}
E.aromatica_02               GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
E.cordigera_24               GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {298}
E.tampensis_27               GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {299}
E.tampensis_alba_23          GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {299}
E.dichroma_74                GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {301}
E.diurna_09                  GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {299}
E.asperula_65                GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {298}
E.candollei_29               GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {301}
E.randii_50                  GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {299}
E.kienastii_235              GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {305}
P.chimborazoensis_51         GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {302}
P.fragrans_172               GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {302}
P.aemula_17                  GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {301}
P.cochleata_31               GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {301}
P.pygmaea_81                 GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {299}
P.pseudopygmaea_205          GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {301}
P.vitellina_57               GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {303}
P.glauca_176                 GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
P.ionocentra_46              GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
P.prismatocarpa_19           GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {302}
P.ochracea_95                GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
P.cretacea_230               GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
E.luteorosea_178             GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
E.luteorosea_173             GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
E.subulatifolia_128          GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {303}
E.subulatifolia_174          GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {304}
E.cyanocolumna_1001          GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {299}
E.tenuissima_143             GGCTCTCGCATCGATGAAGAGCGCAGCGAAATGCGATACGTGGTGCGAAT   {300}
```

Appendix G—continued.

{	360 370 380 390 400	}
{	. . . . .	}
Restrepiella_291	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
Pluer.racemiflora_140	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{344}
Ponera.striata_197	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{360}
Isochilis.major_279	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{364}
Epi.ibaguense_60	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{357}
Epi.conopseum_244	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{354}
Nidema.boothii_192	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
S._pulchella_W208	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
H.imbricata_283	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
Reichenbachanthus_W107	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
Hexadesmia_K336	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{352}
Acrorchis_399	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
Jacquiniella_313	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
Hagsatera_229	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
Homalopetalum_234	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{353}
Meiracyllium_trinas_129	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{353}
Psy.mcconnelliae_W53R	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
Psy.krugii_62	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{349}
Brough.nigrilensis_152	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{352}
Tetramica.elegans_160	TGCAGAATCCCGTGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{353}
Domingoa_225	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{354}
Cattleyopsis_251	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{355}
Brassav.cucullata_130	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{351}
L.rubescens_W284	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{351}
Myrmecophila_281	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{351}
C.dowiana_282	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{346}
Rhy.glauca_N134	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{353}
C.forbesii_59	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{340}
Soph.cernua_145	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
L.purpurata_84	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{355}
Schm.splendida_280	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{351}
E.citrina_54	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{351}
E.mariae_56	TGCAGAATCC-GCGAACCATCGAGAATT-GAACGCAAGTTGCGCCCGAG-	{346}
E.mariae_87	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{353}
D.polybulbon_61	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
D.polybulbon_94	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
E.adenocaula_12	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{348}
E.bractescens_21	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{349}
E.aromatica_02	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
E.cordigera_24	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{348}
E.tampensis_27	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{349}
E.tampensis_alba_23	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{349}
E.dichroma_74	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{351}
E.diurna_09	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{349}
E.asperula_65	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{348}
E.candollei_29	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{351}
E.randii_50	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{349}
E.kienastii_235	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{355}
P.chimborazoensis_51	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{352}
P.fragrans_172	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{352}
P.aemula_17	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{351}
P.cochleata_31	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{351}
P.pygmaea_81	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{349}
P.pseudopygmaea_205	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{351}
P.vitellina_57	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{353}
P.glauca_176	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
P.ionocentra_46	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
P.prismatocarpa_19	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{352}
P.ochracea_95	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
P.cretacea_230	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
E.luteorosea_178	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
E.luteorosea_173	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}
E.subulatifolia_128	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{353}
E.subulatifolia_174	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{354}
E.cyanocolumna_1001	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{349}
E.tenuissima_143	TGCAGAATCCCGCGAACCATCGAGAATTTGAACGCAAGTTGCGCCCGAGG	{350}

Appendix G—continued.

```
{                                              410       420       430       440       450}
{                                                .         .         .         .         .}
Restrepiella_291            CCAGCTGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCATTGCGTCGCTCC   {400}
Pluer.racemiflora_140       CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {394}
Ponera.striata_197          CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {410}
Isochilis.major_279         CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {414}
Epi.ibaguense_60            CCAGCCGGCCGAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {407}
Epi.conopseum_244           CCAACCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {404}
Nidema.boothii_192          CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {400}
S._pulchella_W208           CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {400}
H.imbricata_283             CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {400}
Reichenbachanthus_W107      CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {400}
Hexadesmia_K336             CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {402}
Acrorchis_399               CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {400}
Jacquiniella_313            CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {400}
Hagsatera_229               CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {400}
Homalopetalum_234           CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {403}
Meiracyllium_trinas_129     CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {403}
Psy.mcconnelliae_W53R       CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {400}
Psy.krugii_62               CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {399}
Brough.nigrilensis_152      CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {402}
Tetramica.elegans_160       CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {403}
Domingoa_225                CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {404}
Cattleyopsis_251            CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {405}
Brassav.cucullata_130       CCAGCCGGCCGAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {401}
L.rubescens_w284            CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {401}
Myrmecophila_281            CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAGACGTCGCGTCGCTCC   {401}
C.dowiana_282               CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {396}
Rhy.glauca_N134             CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {403}
C.forbesii_59               CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {390}
Soph.cernua_145             CCAGCAGGCCGAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {400}
L.purpurata_84              CCAGCAGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {405}
Schm.splendida_280          CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {401}
E.citrina_54                CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCATCGCTCC   {401}
E.mariae_56                 CCAGCCGGCCAAGG-CACGTCCGC-TGG-CGTCAAGCGTTGCATCGCTCC   {393}
E.mariae_87                 CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCATCGCTCC   {403}
D.polybulbon_61             CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {400}
D.polybulbon_94             CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {400}
E.adenocaula_12             CCAGCCGGCCGAGGGCACGTCCGCCTGGGCGTCAAGCATCGCGTCGCTCC   {398}
E.bractescens_21            CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCATCGCGTCGCTCC   {399}
E.aromatica_02              CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCATCGCATCGCTCC   {400}
E.cordigera_24              CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCATCGCATCACTCC   {398}
E.tampensis_27              CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCATCGCATCGCTCC   {399}
E.tampensis_alba_23         CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCATCGCATCGCTCC   {399}
E.dichroma_74               CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCGAGCATCGCGTCGCTCC   {401}
E.diurna_09                 CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCATCGCGTCGCTCC   {399}
E.asperula_65               CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCATCGCGTCGCTCC   {398}
E.candollei_29              CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCATCGCATCGCTCC   {401}
E.randii_50                 CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCATCGCGTCGCTCC   {399}
E.kienastii_235             CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {405}
P.chimborazoensis_51        CCAGCCGGCCGAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {402}
P.fragrans_172              CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {402}
P.aemula_17                 CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {401}
P.cochleata_31              CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {401}
P.pygmaea_81                CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {399}
P.pseudopygmaea_205         CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {401}
P.vitellina_57              CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {403}
P.glauca_176                CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTCGCTCC   {400}
P.ionocentra_46             CCAGCCGGCCAAGGGCACGTCCGC-TGGGCGTCAAGCGTTGCGTCGCTCC   {399}
P.prismatocarpa_19          CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {402}
P.ochracea_95               CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {400}
P.cretacea_230              CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {400}
E.luteorosea_178            CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTTGCTCC   {400}
E.luteorosea_173            CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTCGCGTTGCTCC   {400}
E.subulatifolia_128         CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {403}
E.subulatifolia_174         CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {404}
E.cyanocolumna_1001         CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAGGCGTCGCGTCGCTCC   {399}
E.tenuissima_143            CCAGCCGGCCAAGGGCACGTCCGCCTGGGCGTCAAGCGTTGCGTCGCTCC   {400}
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Appendix G—continued.

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{                                             460       470       480       490       500}
{                                               .         .         .         .         .}
Restrepiella_291              GCGCCAACTCCATC-CCACCC-GA-TGGGTG-TGTC---GGTGGGAGGCT    {443}
Pluer.racemiflora_140         GTGCCAGCTCCATC-CCACCC-GA-CGGGTG-CGCA---TGCGGGAGGGC    {437}
Ponera.striata_197            GTGCCACCTCCATC-CCGCCCTGA-CGGGTG-TGTC---GGCC-GAGGCC    {453}
Isochilis.major_279           GTGCCAGCTCCGTC-CCACCC-CA-CGGGTG-TGTC---GGCC-GAGGCC    {456}
Epi.ibaguense_60              GTGCCAACTCCAGC-ACACC--GAACGGGTG-CATC---GGTC-GAGGCT    {449}
Epi.conopseum_244             GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CTAT---GGCC-GAGGCT    {446}
Nidema.boothii_192            GTGCCAACTCCAGC-CCACCC-AA-TGGGTG-CATC---GGCC-GAGGCT    {442}
S._pulchella_W208             GTGCCAACTCCAGC-CCACCC-AA-TGGGTG-CGTC---GGCC-GAGGCT    {442}
H.imbricata_283               GTGCCAACTCCAGC-CCACCC-AA-AGGGTG-CGTC---GGCC-GAGGCT    {442}
Reichenbachanthus_W107        GTGCCAACTCCAGCA-CACCC-AA-AGGGTG-CGTC---GGCC-GAGGCT    {442}
Hexadesmia_K336               GTGCCAACTCCAGG-CCACCC-AA-CGGGTG-CGTC---GGCC-GAGGCT    {444}
Acrorchis_399                 GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGTC---GGCC-GAGGCT    {442}
Jacquiniella_313              GTGCCAACTCCAGC-CAACCC-AA-CGGGTG-CGTC---GGCC-GAGGCT    {442}
Hagsatera_229                 GTGCCAATTCCGGC-CCACCC-AA-CGGGTG-TGTC---GGCC-GAGGCT    {442}
Homalopetalum_234             GTGCCAGCTCCGG-ACCACCC-AA-CGGGTG-CGTC---GGTC-GAGGCC    {445}
Meiracyllium_trinas_129       GTGCCAACCCCAGC-CCACCC-AG-CGGGTG-CGTC---GGTC-GAGGCT    {445}
Psy.mcconnelliae_W53R         GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGCC---GGCC-GAGGCT    {442}
Psy.krugii_62                 GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGCC---GGCC-GAGGCT    {441}
Brough.nigrilensis_152        GTGCTAACTCTAGC-CCACCC-AA-CGGGTG-TGTC---GGCC-GAGGCT    {444}
Tetramica.elegans_160         GTGCCAACTCCAGC-ACACCC-AA-CGGGTG-CGCC---GGCT-GAGGCT    {445}
Domingoa_225                  GTGCCGACTCCGGC-CCACCC-GA-CGGGTG-CGTC---GGTC-GAGGCT    {446}
Cattleyopsis_251              GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGCG-CCGGCC-GAGGCT    {449}
Brassav.cucullata_130         GTGCCGACTCCAGC-CCACCC-AA-CGGGTG-CGTC---GGCG-GAGGCT    {443}
L.rubescens_w284              GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGTT---GGCC-GAGGCT    {443}
Myrmecophila_281              GCGCCAACTCCAGC-CCACCC-AA-GGGGTG-CGCC---GGCC-GAGGCT    {443}
C.dowiana_282                 GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGTC---GGCC-GAGGCT    {438}
Rhy.glauca_N134               GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGTC---GGTC-GAGGCT    {445}
C.forbesii_59                 GTGCCAACTCCGGG----------------------------------CG    {406}
Soph.cernua_145               GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGTG---GGCC-GAGGCT    {442}
L.purpurata_84                GTGCCAACTCCAGC-CCACCC-GAA-GGGTG-CG-C---GGCC-GAGGCT    {446}
Schm.splendida_280            GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGTC---GGCC-GAGGCT    {443}
E.citrina_54                  GTGCCAGCT-TAGC-CCACCC-AA-CGGGTG-TGTC---GGCC-GAGGCT    {442}
E.mariae_56                   GTGCCAGCT-TAGC-CCACCC-AA-CGG-TG-TGTC---G-CC-GAGGCT    {432}
E.mariae_87                   GTGCCAGCT-TAGC-CCACCC-AA-CGGGTG-TGTC---GGTC-GAGGCT    {444}
D.polybulbon_61               GTGCCAACTCCAGC-CCACCC-AA-TGGGTG-CGTT---GGCC-GAGGCT    {442}
D.polybulbon_94               GTGCCAACTCCAGC-CCACCC-AA-TGGGTG-CGTT---GGCC-GAGGCT    {442}
E.adenocaula_12               GTGCCAACTCCGGC-CCACCC-GA-CGGGTGGCGTC---AGCC-GAGGCT    {441}
E.bractescens_21              GTGCCAACTCCGGC-CCACCC-AA-CGGGTGGCGTC---GGCC-GAGGCT    {442}
E.aromatica_02                GTGCCAACTCCGGC-CCACCC-AG-GGGGTGGCGTC---GGCC-GAGGCC    {443}
E.cordigera_24                GTGCCAACTCCGGC-CCACCC-AG-CGGGTGGCGTC---GGCC-GAGGCC    {441}
E.tampensis_27                GTGCCAACTCCGGC-CCACCC-AG-CGGGTGGCGTC---GGCC-GAGGCC    {442}
E.tampensis_alba_23           GTGCCAACTCCGGC-CCACCC-AG-CGGGTGGCGTC---GGCC-GAGGCC    {442}
E.dichroma_74                 GTGCAAACTCCGGC-CCACCC-AG-CGGGTGGCGTC---GGCC-GAGGCC    {444}
E.diurna_09                   GTGCCAACTCCGGC-CCACCC-AG-CGGGTGGCGTC---GGCC-GAGGCC    {442}
E.asperula_65                 GTGCCAGCTCCGGC-CCACCC-AG-CGGGTGGCGTC---GGCC-GAGGCC    {441}
E.candollei_29                GTGCCAACTCCGGC-CCACCC-AG-CGGGTGGCGTC---GGCC-GAGGCC    {444}
E.randii_50                   GTGCCAACTCCGGC-CCACCC-AG-CGGGTGGCGTC---GGCC-GAGGCC    {442}
E.kienastii_235               CAGCCAACTCCGGC-CAACCC-GA-CGGGTGT-GCC---GGCC-GAGGCT    {447}
P.chimborazoensis_51          GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGTC---GGTC-GAGGCT    {444}
P.fragrans_172                GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGTC---GGTC-GAGGCT    {444}
P.aemula_17                   GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGTC---GGTC-GAGGCT    {443}
P.cochleata_31                GTGCCAGCTCCAGC-CCACCC-AA-CGGGTG-CGTC---GGTC-GAGGCT    {443}
P.pygmaea_81                  GTGCCAGATCTAGC-CCACCC-AA-CGGGTG-TGTC---GGTC-GAGGCT    {441}
P.pseudopygmaea_205           GTGCCAACTCCAGC-CCGCCC-AA-CGGGTG-TGTC---GGTC-GAGGCT    {443}
P.vitellina_57                GTGCCGACTCCAGC-CCACCC-GA-CGGGTG-TGCC---GGTC-GAGGCT    {445}
P.glauca_176                  GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-CGTC---GGCC-GAGGCT    {442}
P.ionocentra_46               GTGCCAACCCCAGC-CCACCC-AA-CGGGTG-TGTC---GGCC-GAGGCT    {441}
P.prismatocarpa_19            GTGCCAACCCCAGC-CCACCC-AA-CGGGTG-TGTC---GGCC-GAGGCT    {444}
P.ochracea_95                 GTGCCACCTCCAGC-CCACCC-GA-CGGGTG-TGTC---GGTC-GAGGCT    {442}
P.cretacea_230                GTGCCAACTCCAGC-CCACCC-AA-CGGGTG-TGTC---GGTC-GAGGCT    {442}
E.luteorosea_178              GTGCCAACTCCAGC-CCACCC-GA-CGGGTG-TGTC---GGCC-GAGGCT    {442}
E.luteorosea_173              GTGCCAACTCCAGC-CCACCC-GA-CGGGTG-TGTC---GGCC-GAGGCT    {442}
E.subulatifolia_128           GTGCCAACTCCAGG-CCACCC-GA-TGGGTG-CGCC---GGTC-GAGGCT    {445}
E.subulatifolia_174           GTGCCAACTCCAGG-CCACCC-GA-TGGGTG-CGCC---GGTC-GAGGCT    {446}
E.cyanocolumna_1001           GTGCCAGCCCCAGC-CCGCCC-GA-TGGGTG-TGCC---GGCC-GAGGCT    {441}
E.tenuissima_143              GTGCCAACTCCGGC-CCGCCC-GA-TGGGCG-TGCC---GGCC-GAGGCT    {442}
```

Appendix G—continued.

```
{                                        510       520       530       540       550}
{                                          .         .         .         .         .}
Restrepiella_291            CGGATGTGCAGAGTGGCTCGCCGTGCCC--AT-C-GGTGCGGCGGGCTGA   {489}
Pluer.racemiflora_140       CGGAAGTGCAGAGTGGCTCGTCGTGCCC--GC-G-GGCGCGGCGGGCTGA   {483}
Ponera.striata_197          CGGACGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGCGCGGCGGGCTGA   {499}
Isochilis.major_279         CGGACGTGCGGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {502}
Epi.ibaguense_60            CGGATGTGTAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGTCGGGCTGA   {495}
Epi.conopseum_244           CGGATGTGTAGAGTGGCCCGTCGTGCCT--GC-C-GGTGCGGCGGGCTGA   {492}
Nidema.boothii_192          CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {488}
S._pulchella_W208           CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {488}
H.imbricata_283             CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGAGCTGA   {488}
Reichenbachanthus_W107      CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGAGCTGA   {488}
Hexadesmia_K336             CGGATGTGCAGAGTGGCCCGTCGTGCCC---TTC-GGTGCGGCGGGCTGA   {490}
Acrorchis_399               CGGATGTGCAGAGTGGCCCGTCGTGCAA--AT-C-GGTGCGGCGGGCTGA   {488}
Jacquiniella_313            CGGATGTGCAGAGTGGCCCGTCGTGCCG--GT-C-GGTGCGGCGGGTTGA   {488}
Hagsatera_229               CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGTTGA   {488}
Homalopetalum_234           CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-A-GGTGCGGTGGGCTGA   {491}
Meiracyllium_trinas_129     CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {491}
Psy.mcconnelliae_W53R       CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {488}
Psy.krugii_62               CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {487}
Brough.nigrilensis_152      CGGATGTGTAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {490}
Tetramica.elegans_160       CGGATGTGCAGAGTGGCCCGTCGTGCAC--GT-CGGGTGCGGCGGGCTGA   {492}
Domingoa_225                CGGATGCGCAGAGTGGCTCGTCGTGCCC--GT-C-GGCGCGGCGGGCTGA   {492}
Cattleyopsis_251            CGGATGTGCAGAGTGGCCCGTCGTGCCC--GTT--GGTGCGGCGGGCTGA   {495}
Brassav.cucullata_130       CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {489}
L.rubescens_w284            CGGATGTGCAGAGTGGCCCGTCGTGCCA--GT-C-GGTGCGGCGGGCTGA   {489}
Myrmecophila_281            CGGATGTGCAGAGTGGCCCGTCGTGCCG--GT-C-GGTGCGGCGGGCTGA   {489}
C.dowiana_282               CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGG-CTGA   {483}
Rhy.glauca_N134             CGGATGTGTAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {491}
C.forbesii_59               CGGATGTGCAGAGTGGCCCGTC?TATTA--TTTC-GGTGCGGCGGGCTGA   {453}
Soph.cernua_145             CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {488}
L.purpurata_84              CGGACGTGCAGAGTGGCCCGTCGTGCCG--GT-C-GGTGCGGCGGGCTGA   {492}
Schm.splendida_280          CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {489}
E.citrina_54                CGGATGTGCAGAGTGGCCCGTCGTGCCC--AT-C-GGTGCGGCGGGCTGA   {488}
E.mariae_56                 CGGATGTGCAGAGTGGCC-GTCGTGCCC--AT-C--GTGCGGCGG-CTGA   {475}
E.mariae_87                 CGGATGTGCAGAGTGGCCCGTCGTGCCC--AT-C-GGTGCGGCGGGCTGA   {490}
D.polybulbon_61             CGGATGTGCAGAGTGGCTCGTCGTGCCCC-GT-C-GGTGCGGCGGGCTGA   {489}
D.polybulbon_94             CGGATGTGCAGAGTGGCTCGTCGTGCCCC-GT-C-GGTGCGGCGGGCTGA   {489}
E.adenocaula_12             CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {487}
E.bractescens_21            CGGATGTGCATAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {488}
E.aromatica_02              TGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGTGGGCTGA   {489}
E.cordigera_24              TGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {487}
E.tampensis_27              CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {488}
E.tampensis_alba_23         CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {488}
E.dichroma_74               CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {490}
E.diurna_09                 CGGATGTGCAGAGTGGCCCGTCGTGCCC--GTTC-GGTGCGGCGGGTTGA   {489}
E.asperula_65               CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGTTGA   {487}
E.candollei_29              TGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {490}
E.randii_50                 CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {488}
E.kienastii_235             CGGATGTGCAGAGTGGCCCGACGTGCC---GGCC-GGTGCGGCGGGCTGA   {493}
P.chimborazoensis_51        CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {490}
P.fragrans_172              CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {490}
P.aemula_17                 CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {489}
P.cochleata_31              CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {489}
P.pygmaea_81                CGGATGTCCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {487}
P.pseudopygmaea_205         CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {489}
P.vitellina_57              CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {491}
P.glauca_176                CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTCA   {488}
P.ionocentra_46             CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {487}
P.prismatocarpa_19          CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGGGGGCTGA   {490}
P.ochracea_95               CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGCGCGGCGGGCTGA   {488}
P.cretacea_230              CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {488}
E.luteorosea_178            CGGATGTGCAGAGTGGCCCGTCGTGCCG--GT-C-GGTGCGGCGGGCTGA   {488}
E.luteorosea_173            CGGATGTGCAGAGTGGCCCGTCGTGCCG--GT-C-GGTGCGGCGGGCTGA   {488}
E.subulatifolia_128         CGGACGTGCAGAGTGGCCCGTCGTGCCC--GT-G-GGCGCGGCGGGCTGA   {491}
E.subulatifolia_174         CGGACGTGCAGAGTGGCCCGTCGTGCCC--GT-G-GGCGCGGCGGGCTGA   {492}
E.cyanocolumna_1001         CGGATGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGTGCGGCGGGCTGA   {487}
E.tenuissima_143            CGGACGTGCAGAGTGGCCCGTCGTGCCC--GT-C-GGCGCGGCGGGCTGA   {488}
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Appendix G—continued.

```
{                                              560       570       580       590       600}
{                                                .         .         .         .         .}
Restrepiella_291              AGAGCGGGTGATCGTCTCATT---GGCCACGAACAGCAAGGGGTGGAT--   {534}
Pluer.racemiflora_140         AGAGAGGGCGATCGTCTCGTT---GGCCACGAACAACAAGGGGTGGAT--   {528}
Ponera.striata_197            AGAGCGGGTCGTCGTCTCATCATCGGCCGCGAACAACTAGGGGTGGATGC   {549}
Isochilis.major_279           AGAGTGGGTCGTCATCTCATCACCGGCCGCGAGCAACTAGGGGTGGAT--   {550}
Epi.ibaguense_60              AGATTGGGTCATCGTCTCATC---GGCCATGAACAGCAAGGGGTGGAT--   {540}
Epi.conopseum_244             AGAGTGGGTGATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {537}
Nidema.boothii_192            AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
S._pulchella_W208             AGAGTGGGTAATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
H.imbricata_283               AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
Reichenbachanthus_W107        AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
Hexadesmia_K336               AGAGTGGGTCATCGTCTCATC---GGCGACGAACAGCAAGGGGTGGAT--   {535}
Acrorchis_399                 AGAGCGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
Jacquiniella_313              AGAGCGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
Hagsatera_229                 AGAGTGGGTCATCGTCTCATC---GGCCACGAACGGCAAGGGGTGGAT--   {533}
Homalopetalum_234             AGAGTGGGTAATCGTCTCATC---GGCCACGAACAGTAAGGGGTGGAT--   {536}
Meiracyllium_trinas_129       AGAGTGGGTGATCATCTCATCGCCGGCCACGAACAGCAAGGGGTGGAT--   {539}
Psy.mcconnelliae_W53R         AGAGCTGGTCATTGTCTCGTC---GGCCGCGAACAGCAAGGGGTGGAT--   {533}
Psy.krugii_62                 AGAGCTGGTCATTGTCTCGTC---GGCCGCGAACAGCAAGGGGTGGAT--   {532}
Brough.nigrilensis_152        AGAGCCGGTTGTCGTCTCGTC---GGCTACGAACAGCAAGGGGTGGAT--   {535}
Tetramica.elegans_160         AGAGCTGGTCACTGTCTCATC---GGCCACGAACAGCAAAGGGTGGAT--   {537}
Domingoa_225                  AGAGTGGGTCGTCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {537}
Cattleyopsis_251              AGAGCTGGTCATCGTCTCGTC---GGCCACGAACAGCAAGGGGTGGAT--   {540}
Brassav.cucullata_130         AGAGCGGGTCATCGTCTCGCC---GGCCACGGACAGCAAGGGGTGGAT--   {534}
L.rubescens_w284              AGAGTGGGTCATCGTCTCATC---GGCCACGGACAGCAAGGGGTGGAT--   {534}
Myrmecophila_281              AGAGTGGGTCGTCGTCTCGCC---GGCCGCGAACAGCAAGGGGTGGAT--   {534}
C.dowiana_282                 AGATTGGGTCATCGTCTCGCC---GGCCACGAACAGCAAGGGGTGGAT--   {528}
Rhy.glauca_N134               AGAGTGGGTCATCGTCTCGCC---GGCCACGAACAGCAAGGGGTGGAT--   {536}
C.forbesii_59                 AGAGCGGGTCAACGTCTCGCC---GGCGACGAACAGCAAGGGGTGGAT--   {498}
Soph.cernua_145               AGAGTGGGTCGTAGTCTCGCC---GGCGGCGAACAGCAAGGGGTGGAT--   {533}
L.purpurata_84                AGAGCGGGTCATAGTCTCGCC---GGCCACGAACAGCAAGGGGTGGAT--   {537}
Schm.splendida_280            AGAGTGGGTGTTCGTCTCATC---GGCCACGGACAGCAAGGGGTGGAT--   {534}
E.citrina_54                  AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
E.mariae_56                   AGAGTGGGTCATCGTCTCATC----GCCACGAACAGCAAGGG-TGGAT--   {518}
E.mariae_87                   AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {535}
D.polybulbon_61               AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {534}
D.polybulbon_94               AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {534}
E.adenocaula_12               AGAGTGGGTCATCGTCTCACC---GGCGACGAGCAGCAAGGGGTGGAT--   {532}
E.bractescens_21              AGAGTGGGTCATCGTCTCATC---GGCGACGAGCAGCAAGGGGTGGAT--   {533}
E.aromatica_02                AGATCGGGTCATCGTCTCATC---GGCGACGAGCAGCGAGGGGTGGAT--   {534}
E.cordigera_24                AGATCGGGTCATCGTCTCATC---GGCGACGAGCAGCGAGGGGTGGAT--   {532}
E.tampensis_27                AGAGCGGGTCATCGTCTCATC---GGCGACGAGCAGCGAGGGGTGGAT--   {533}
E.tampensis_alba_23           AGAGCGGGTCATCGTCTCATC---GGCGACGAGCAGCGAGGGGTGGAT--   {533}
E.dichroma_74                 AGAGCGGGTCATCGTCTCATC---GGCGACGAGCGGCGAGGGGTGGAT--   {535}
E.diurna_09                   AGAGCGGGTCATCGTCTCACC---GGCGACGAGCAGCGAGGGGTGGAT--   {534}
E.asperula_65                 AGAGCGGGTCATCGTCTCATC---GGCGACGAGCAGCGAGGGGTGGAT--   {532}
E.candollei_29                AGATCGGGTCATCGTCTCATC---GGCGACGAGCAGCGAGGGGTGGAT--   {535}
E.randii_50                   AGAGCGGGTCATCGTCTCATC---GGCGACGAGCAGCGAGGGGTGGAT--   {533}
E.kienastii_235               AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {538}
P.chimborazoensis_51          AGAGTGGGTCGTCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {535}
P.fragrans_172                AGAGTGGGTCGTCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {535}
P.aemula_17                   AGAGTGGGTCGTCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {534}
P.cochleata_31                AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {534}
P.pygmaea_81                  AGAGCGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {532}
P.pseudopygmaea_205           AGAGCGGGTCGTCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {534}
P.vitellina_57                AGAGTGGGTCGTCGTCTCACC---GGCCACGAACAGCAAGGGGTGGAT--   {536}
P.glauca_176                  AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCGAGGGGTGGAT--   {533}
P.ionocentra_46               AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {532}
P.prismatocarpa_19            AGAGTGGGTCGTCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {535}
P.ochracea_95                 AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
P.cretacea_230                AGAGTGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
E.luteorosea_178              AGAGCGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
E.luteorosea_173              AGAGCGGGTCATCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
E.subulatifolia_128           AGAGTGGGTCATCGTCTCATC---GGCCACGATCAGCAAGGGGTGGAT--   {536}
E.subulatifolia_174           AGAGTGGGTCATCGTCTCATC---GGCCACGATCAGCAAGGGGTGGAT--   {537}
E.cyanocolumna_1001           AGAGTGGGTCGTCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {532}
E.tenuissima_143              AGAGCGGGTCGTCGTCTCATC---GGCCACGAACAGCAAGGGGTGGAT--   {533}
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Appendix G—continued.

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{                                              610       620       630       640       650}
{                                                .         .         .         .         .}
Restrepiella_291              ------GAAA----GTTGTGCCTGTGTTGT---ATCGTGTCGGCCTGAGA   {571}
Pluer.racemiflora_140         ------GAAAA----TTGTGCCTGTGTTGT---ATCGTGCCGGCATGAGA   {565}
Ponera.striata_197            CGCCATGCAGA---GCTGTGCCTACGTTGT---ATCGTGCTGGCCCGAGA   {593}
Isochilis.major_279           -GCCATGCAAA---GCCGTGCCTACGTTGCGC-ATCGCGATGGCCTGAGA   {595}
Epi.ibaguense_60              ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGATCGAGA   {577}
Epi.conopseum_244             ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGGGA   {574}
Nidema.boothii_192            ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {570}
S._pulchella_W208             ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {570}
H.imbricata_283               ------GAAA----GTTGTGCCTGTGCTGCGC-GTCGTGCCGGCCCGAGA   {572}
Reichenbachanthus_W107        ------GAAA----GTTGTGCCTGTGCTGCGC-GTCGTGCCGGCCCGAGA   {572}
Hexadesmia_K336               ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCTGCCAGAGA   {572}
Acrorchis_399                 ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {570}
Jacquiniella_313              ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {570}
Hagsatera_229                 ------GAAA----GTTGTGCCTGTG-TGCTGCTTCGTGCCGGCCAGAGA   {572}
Homalopetalum_234             ------GAAA----GTTGTGCCTGTGCTGGCT---CGTGGCGGCTCGAGA   {573}
Meiracyllium_trinas_129       ------GAAA----GTTGTGCCTGTGTTGCGT---CGTGCCGGCCCGAGA   {576}
Psy.mcconnelliae_W53R         ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {570}
Psy.krugii_62                 ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {569}
Brough.nigrilensis_152        ------GAAA----GTTGTGCCTGTGTTGCGT---CGTGCCGGCCCGAGA   {572}
Tetramica.elegans_160         ------GAAA----GTTGTGCCTGCGCTGCGT---CGTGCCGGCCCGAGA   {574}
Domingoa_225                  ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGGCGGCTCGAGA   {574}
Cattleyopsis_251              ---GATGAAA-GTTGTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {583}
Brassav.cucullata_130         ------GAAA----GTTGTGCCTGTGCTGCGC---CGTGCCGGCCCGAGA   {571}
L.rubescens_w284              ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {571}
Myrmecophila_281              ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {571}
C.dowiana_282                 ------GAAA----GTTGTGCCTGTGCTGCGC---CGTGCCGGCCCGAGA   {565}
Rhy.glauca_N134               ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {573}
C.forbesii_59                 ------GAAA----GTTGTGCCTGTGCTGCGC---CGTGCCGGCCCGAGA   {535}
Soph.cernua_145               ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGGCGGAGA   {570}
L.purpurata_84                ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCGGAGA   {574}
Schm.splendida_280            ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {571}
E.citrina_54                  ------GAAAA----TTGTGCCTGTGTTGCGT---CGTGCCGGCCCGAGA   {570}
E.mariae_56                   ------GAAA-----TTGTGCCTGTGTTGCGT---CGTGCC--CC-GAGA   {551}
E.mariae_87                   ------GAAAA----TTGTGCCTGTGTTGCGT---CGTGCCGGCCCGAGA   {572}
D.polybulbon_61               ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {571}
D.polybulbon_94               ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {571}
E.adenocaula_12               ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCTGCCCGAGG   {569}
E.bractescens_21              ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCGTGCCCGAGA   {570}
E.aromatica_02                ------GAAA----GTTGTGCCTGTGCTGCGT--TCGTGCCTGCCCGAGA   {572}
E.cordigera_24                ------GAAA----GTTGTGCCTGTGCTGCGT--TCGTGCCTGCCCGAGA   {570}
E.tampensis_27                ------GAAA----GTTGTGCCTGTGCTGCGT--TCGTGCCTGCCCGAGA   {571}
E.tampensis_alba_23           ------GAAA----GTTGTGCCTGTGCTGCGT--TCGTGCCTGCCCGAGA   {571}
E.dichroma_74                 ------GAAA----GTTGTGCCTGTGCTGCGT--TCGTGCCTGCCCGAGA   {573}
E.diurna_09                   ------GAAA----GTTGTGCCTGTGCTGCGT--TCGTGCCTGCCCGAGA   {572}
E.asperula_65                 ------GAAA----GTTGTGCCTGTGCTGCGT--TCGTGCCTGCCCGAGA   {570}
E.candollei_29                ------GAAA----GTTGTGCCTGTGCTGCGT--TCGTGCCTGCCCGAGA   {573}
E.randii_50                   ------GAAA----GTTGTGCCTGTGCTGCGT--TCGTGCCTGCCCGAGA   {571}
E.kienastii_235               ------GAAA----GCTGTGCCTGTGCTGCGT---CGTGCCGGCCAGAGA   {575}
P.chimborazoensis_51          ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCGGAGA   {572}
P.fragrans_172                ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCAGAGA   {572}
P.aemula_17                   ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCGGAGA   {571}
P.cochleata_31                ------GAAA----GCTGTGCCTGTGCTGCGT---CGTGCCGGCAAGAGA   {571}
P.pygmaea_81                  ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCAGAGA   {569}
P.pseudopygmaea_205           ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCAGAGA   {571}
P.vitellina_57                ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCGGAGA   {573}
P.glauca_176                  ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCGGAGA   {570}
P.ionocentra_46               ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCAGAGA   {569}
P.prismatocarpa_19            ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCAGAGA   {572}
P.ochracea_95                 ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCAGAGA   {570}
P.cretacea_230                ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {570}
E.luteorosea_178              ------GAAA----GTTGTGCCTGTGCTGCAT---CGTGCCGGCCCGAGA   {570}
E.luteorosea_173              ------GAAA----GTTGTGCCTGTGCTGCAT---CGTGCCGGCCCGAGA   {570}
E.subulatifolia_128           ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {573}
E.subulatifolia_174           ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {574}
E.cyanocolumna_1001           ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {569}
E.tenuissima_143              ------GAAA----GTTGTGCCTGTGCTGCGT---CGTGCCGGCCCGAGA   {570}
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Appendix G—continued.

```
{                                         660        670        680        690        700}
{                                           .          .          .          .          .}
Restrepiella_291              AAAA-------TT-----ATACCT-TGTTGAT----GATCCC-GGCCCAA   {603}
Pluer.racemiflora_140         AGA------GATC---ATAGGCCA-TGCGGAT----GATCCC-AGCCCGA   {600}
Ponera.striata_197            AAA------GACC-----GTGCCCC-ACAGGC----GATCCC-AACCCAC   {626}
Isochilis.major_279           AAA------GATC-----GCGCCT-CCC-GGC----GATCCC-GACCCAT   {627}
Epi.ibaguense_60              AGA------GATT-----ATACCTTTG-AGGT----GATCCC-AACCCAT   {610}
Epi.conopseum_244             AAA------GATT-----GTACCTTCC-ACGT----GATCCC-GACCCAT   {607}
Nidema.boothii_192            AAA------GAT-----TATACCTTCC-AGGT----GATCCC-AACCCAT   {603}
S._pulchella_W208             AAA------GAT------GTGCCTTCT-AGGT----GATCCC-AACCCAT   {602}
H.imbricata_283               AAA------GATT-----ATACCTTCT-AGGT----GATCCC-AACCCAT   {605}
Reichenbachanthus_W107        AAA------GATT-----ATACCTTCT-AGTT----GATCCC-AACCCAT   {605}
Hexadesmia_K336               AAA------GATT-----GTACCTTAT-AGGT----GATCCC-AACCCAT   {605}
Acrorchis_399                 AAA------GATT-----ATACCCTCT-AGGTGA----TCCC-AACCCAT   {603}
Jacquiniella_313              AAA------GATT-----ATACCTTCA-AGGT----GATCCC-AACCCAT   {603}
Hagsatera_229                 AAA------GATT---ATGTACCTTCC-AGGT----GATCCC-AACCCAT   {607}
Homalopetalum_234             AAA------GATT-----ATACCTCCC-AGGT----GATCCC-AACCCAT   {606}
Meiracyllium_trinas_129       AAA------GATT-----ATGCCTTT--AGGTGA-TGATCCC-AACCCAT   {611}
Psy.mcconnelliae_W53R         AAA------GACTG-TA-ATACCCTCC-AGGT----GATCCC-AACCCAT   {606}
Psy.krugii_62                 AAA------GACTG-TA-ATACCCTCC-AGGT----GATCCC-AACCCAT   {605}
Brough.nigrilensis_152        AAAA-----GACT-----ATACCCTCC-AGGT----GATCCC-AACCCAT   {606}
Tetramica.elegans_160         AAA------GACC-----ATACCCACC-AGGT----GATCCC-AACCCAT   {607}
Domingoa_225                  AAA------GATT-----ATACCCTTCCAGGT----GATCCC-AGCCCAT   {608}
Cattleyopsis_251              AAA------GACT-----ATACCCTCC-AGGT----GATCCC-AACCCAT   {616}
Brassav.cucullata_130         GAA------GATC-----AGACCCTGC-AGGT----GATCCC-AGCCCAT   {604}
L.rubescens_w284              AAA------GATT-----ATACCTTCC-AGGT----GATCCC-AACCCAT   {604}
Myrmecophila_281              AGA------GATC-----ATGC-TTCC-AGGT----GATCCC-AACCCAC   {603}
C.dowiana_282                 AAA------GATC-----ATGCCTTGC-A-GT----GATCCC-AACCCAT   {597}
Rhy.glauca_N134               AAA------GATC-----ATACCTTCC-AGGT----GATCCC-AACCCAT   {606}
C.forbesii_59                 TGA------GATCAT-C-ATGCCTTCG-AGGCGA--GATCCC-AGCCCAT   {573}
Soph.cernua_145               GAA------GATC-----GGACCCTCG-AGGC----GATCCC-AACCCAT   {603}
L.purpurata_84                GAA------GATC-----ATACCTTGC-ATTTGG-TGATCCC-AGCCCAT   {610}
Schm.splendida_280            AAA------GATT-----ATACCTTCC-AGGT----GATCCC-GACCCAT   {604}
E.citrina_54                  AAA------GATTC----ATACCTTTC-AGGTGA--GATCCC-AACCCAT   {606}
E.mariae_56                   AAA------GATT-----A-AC-TT-C-ATGTGA--GATCCC---CCCAT   {581}
E.mariae_87                   GAA------GATTT----AAACCTTTC-ATGTGA--GATCCC-AACCCAT   {608}
D.polybulbon_61               AAA------GAT-G----ATACCTTCT-AGG-----GATCCC-AACCCAT   {603}
D.polybulbon_94               AAA------GAT-G----ATACCTTCT-AGGT----GATCCC-AACCCAT   {604}
E.adenocaula_12               AAA------GATTA--T-ATACCTT-AAAGGT----GATCCC-AACCCAT   {604}
E.bractescens_21              AAA------GATTG--T-ATACCGT-AAAGGT----GATCCC-GACCCAT   {605}
E.aromatica_02                AAA------GATTA--TT-TTCCTTTGAAGGT----GATCCCCAACCCAT   {609}
E.cordigera_24                AAA------GATTA--TT-TTCCTTTGAAGGT----GATCCC-AACCCAT   {606}
E.tampensis_27                AAA------GATTAG-TT-TTCCTTTGAAGGT----GATCCC-AACCCAT   {608}
E.tampensis_alba_23           AAA------GATTAG-T--TTCCTTTGAAGGT----GATCCC-AACCCAT   {607}
E.dichroma_74                 AAA------GATTA--TT-TTCCTTTGAAGGT----GATCCC-AACCCAT   {609}
E.diurna_09                   AAA------GATTA--TT-TTCCTTTGAAGGT----GATCCC-AACCCAT   {608}
E.asperula_65                 AAA------GATTA--TT-TTCCTTTGAAGGT----GATCCC-AACCCAT   {606}
E.candollei_29                AAA------GATTA--TT-TTCTTTTGAAGGT----GATCCC-AACCCAT   {609}
E.randii_50                   AAA------GATTA--TT-TTCCTTTGAAGGT----GATCCC-AACCCAT   {607}
E.kienastii_235               AAA------GATTA-----CACCT-GCCAGGT----GATCCC-AACCCAT   {608}
P.chimborazoensis_51          AGA------GATT-----ATAC-TTGC-AGGC----GATCCC-AACCCAT   {604}
P.fragrans_172                AGA------GATT-----GTACCTCCC-AGGC----GATCCC-AACCCAT   {605}
P.aemula_17                   AGA------GATT-----ATACCTTCC-AGGC----GATCCC-AACCCAT   {604}
P.cochleata_31                AGA------GATT-----ATACCTTCC-AGGT----GATCCC-AACCCAT   {604}
P.pygmaea_81                  AAA------GATG-----ATACCTTGC-AGGT----GATCCC-AACCCAT   {602}
P.pseudopygmaea_205           AAA------GATG-----ATACCTTGC-AGGT----GATCCC-AACCCAC   {604}
P.vitellina_57                AAA------GATT-----ATACCTTCC-AGGC----GATCCC-AACCCAT   {606}
P.glauca_176                  GAA------GATT-----ATGCCCTCC-ATGT----GATCCC-AACCCAC   {603}
P.ionocentra_46               AAA------GATT-----ATACCTTCC-AGGT----GATCCC-AACCCAT   {602}
P.prismatocarpa_19            AGA------GATT-----ATACCTTCC-AGGT----GATCCC-AACCCAT   {605}
P.ochracea_95                 AAA------GATT-----ATACCTACC-AGGT----GATCCC-AACCCAT   {603}
P.cretacea_230                AAA------GATT-----ATACCTTCC-AGGC----GATCCC-AACCCAT   {603}
E.luteorosea_178              AAA------GATT-----ATACCTTCC-AGGT----GATCCT-AACCCAT   {603}
E.luteorosea_173              AAA------GATT-----ATACCTTCC-AGGT----GATCCT-AACCCAT   {603}
E.subulatifolia_128           AAAA-----GATT-----ATGGCTCCCGAGGT----GATCCC-GACCCAT   {608}
E.subulatifolia_174           AAAA-----GATT-----ATGGCTCCC-AGGT----GATCCC-GACCCAT   {608}
E.cyanocolumna_1001           AGA------GATT---ATGTACCTTCCAGGAG----AATCCC-AACCCAT   {605}
E.tenuissima_143              AGA------GATTT---AGTACTTTC-GAGGT----GATCCC-AACCCAT   {605}
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Appendix G—continued.

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                                                                              |<-trnL Start
{                                            710        720        730        740        750}
{                                              .          .          .          .          .}
Restrepiella_291             GC-GTC------GAT-CA-AA-----AGA-CGGCGGCTTGGGAT?-----    {633}
Pluer.racemiflora_140        GC-GTC------GAT-CC-------GCGGACGGCGGCTTGGAAT?-----    {630}
Ponera.striata_197           GC-GCC------GAT-CCA--CT----GG-CGGCGGCTTGGAAT?-----    {656}
Isochilis.major_279          GC-GCC------GAT-CCGAAC----CGG-CGGCGGCTTGGAAT?-----    {659}
Epi.ibaguense_60             GC-GCC------GAT-CCCAAA----GGG-CGGCGGCTTGGAAT?-----    {642}
Epi.conopseum_244            GC-GCC------GAC-CC-AAC----GGG-CGGCGGCTTGGAAT?-----    {638}
Nidema.boothii_192           GC-GCC------GTT-CC-A-C----GGG-CGGCGGCTTGGAAT?-CCCG    {637}
S._pulchella_W208            GC-GCC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT?--TC-    {634}
H.imbricata_283              GC-GTC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {635}
Reichenbachanthus_W107       GC-GTC------GAT-CC-A-C----GGG-CGACGGCTTGGAAT?---CC    {637}
Hexadesmia_K336              GC-GCC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT?----C    {636}
Acrorchis_399                GC-GCC------GAT--CCA-C----GGG-CGGCGGCTTGGAAT?-----    {633}
Jacquiniella_313             GC-GCC------GAT-CC-GAC----GAT-CGGCGGCTTGGAAT?---CC    {636}
Hagsatera_229                GC-GCC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT?--TCC    {640}
Homalopetalum_234            GC-GTC------GGT-CC-A-C----GGG-CGGCGGCTTGGAAT?TTTCC    {641}
Meiracyllium_trinas_129      GC-GCT------GGT-CCCAGCGGGTGGG-CGGCGGCTTGGAAT?---TC    {649}
Psy.mcconnelliae_W53R        GC-GCCGG--CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?---TC    {642}
Psy.krugii_62                GC-GCCGG--CCGATTCC-A-C----GGG-CGGCGGCTTGGAAT?--TCC    {643}
Brough.nigrilensis_152       GC-GCC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT?--TCC    {639}
Tetramica.elegans_160        GC-GCCG--TCCGAT-CC-A-C----GG--CGGCGGCTTGGAAT?--TCC    {643}
Domingoa_225                 GC-GCC------GGT-CC-A-C----GGG-CGGCGGCTTGGAAT?--TCC    {641}
Cattleyopsis_251             GC-GCCG------AT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {646}
Brassav.cucullata_130        GTCGCC------GTT-CC-A-C----GGG-CGGCGGCTTGGAAT?--TCC    {638}
L.rubescens_w284             GC-GCC------G-T-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {633}
Myrmecophila_281             GC-GCC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {633}
C.dowiana_282                GC-GCC------GAT-CC-A-C----GGT-CGGCGGCTTAGA-T?-----    {626}
Rhy.glauca_N134              GC-GTC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT?----C    {637}
C.forbesii_59                GC-GCCG---C-GTA-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {605}
Soph.cernua_145              GC-GCC------GTTACCCA-C----GGG-CGGCGGCTTGGAAT?--CC-    {637}
L.purpurata_84               GC-GCC------GGT-CC-A-C----GGG-CGGCGGCTTGGAAT?---C-    {641}
Schm.splendida_280           GC-GCC------GGT-CC-A-C----GGG-CGGCGGCTTGGAAT?--TC-    {636}
E.citrina_54                 GC-GCC------GAT-CCCA-T----GGG-CGGCGGCTTGGAAT?--CCG    {640}
E.mariae_56                  GC-GCCG---CCGAT-CC-A-C----GGG-CG-CGGCT-GGAAT?--CCG    {615}
E.mariae_87                  GC-GCC------GAT-CC-A-T----GGG-CGGCGGCTTGGAAT?--CCG    {641}
D.polybulbon_61              GC-GCC------GTT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {633}
D.polybulbon_94              GC-GCC------GTT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {634}
E.adenocaula_12              GC-GCCGG-CCCGGT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {639}
E.bractescens_21             GC-GCCGGTCCCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {641}
E.aromatica_02               GC-GCCGGT-CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?--CCC    {647}
E.cordigera_24               GC-GCCGGT-CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {641}
E.tampensis_27               GC-GCCGGTCCCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {644}
E.tampensis_alba_23          GC-GCCGGT-CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?---TC    {644}
E.dichroma_74                GC-GCCGAT-CCGAT-CC-A-C----GGG-CGGCGTCTTGGAAT?-----    {644}
E.diurna_09                  GC-GCCGGTGCCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {644}
E.asperula_65                GC-GCCGGT-CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {641}
E.candollei_29               GC-GCCGGT-CCGAATCC-A-C----GGT-CGGCGGCTTGGCAT?-----    {645}
E.randii_50                  GC-GCCGGT-CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?---TC    {644}
E.kienastii_235              GC-GCC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT------    {637}
P.chimborazoensis_51         GC-GCCG---CCGAT-CC-A-C----GGG-CG-CGGCT-GGAAT?-----    {635}
P.fragrans_172               GC-GCCG---CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {638}
P.aemula_17                  GC-GCCG---CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {637}
P.cochleata_31               GC-TCCG---CCGAT-CCAGGC----GG--CGGCGGCTTGGAAT?---TC    {640}
P.pygmaea_81                 GC-GCCG---CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?----C    {636}
P.pseudopygmaea_205          GC-GCCG---CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?--TCG    {640}
P.vitellina_57               GC-GCCG---TCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?----C    {640}
P.glauca_176                 GC-GTCG---TCGGT-CC-A-C----GGG-CGGCGGCTTGGAAT?----C    {637}
P.ionocentra_46              GC-GCCG---TCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?--AGC    {638}
P.prismatocarpa_19           GC-GCCG---CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?---CC    {640}
P.ochracea_95                GC-GCCG---CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {636}
P.cretacea_230               GC-GCCG---CCGAT-CC-A-C----GGG-CGGCGGCTTGGAAT?--TCC    {639}
E.luteorosea_178             GC-GTC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT?--TCC    {636}
E.luteorosea_173             GC-GTC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT?--TCC    {636}
E.subulatifolia_128          GC-GCC------GAT-CC-AAC----GGG-CGGCGGCTTGGAAT?---TC    {641}
E.subulatifolia_174          GC-GCC------GAT-CC-AAC----GGG-CGGCGGCTTGGAAT?---TC    {641}
E.cyanocolumna_1001          GC-GCC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT?--CCG    {638}
E.tenuissima_143             GC-GCC------GAT-CC-A-C----GGG-CGGCGGCTTGGAAT?-----    {635}
```

Appendix G—continued.

{	760 770 780 790 800}	
{	. . . . .}	
Restrepiella_291	-----------GGT-AGAA-GG-CTATGGACT-TGATTGG-GTT-GAG--	{664}
Pluer.racemiflora_140	---CCCGATCGGGT-AGA--CG-CTACGGACT-TGAT-GGGATT-GAG--	{668}
Ponera.striata_197	---CCCATC?GGGT-AG---CGGCTACGGACT-TAAT-GG-ATT-GAG--	{693}
Isochilis.major_279	--AG--	{661}
Epi.ibaguense_60	-----TTTTTCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{678}
Epi.conopseum_244	---------TTCGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{670}
Nidema.boothii_192	AA------TCGG-T-AGA--CGA-TACGGACT-TGATTGG-ATT-GAG--	{671}
S._pulchella_W208	-GAAA----TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{670}
H.imbricata_283	---CCGAATTCGGT-AGA--CG-TT-CGGACT-TGATTGG-ATT-GAG--	{672}
Reichenbachanthus_W107	CGAA-----TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{673}
Hexadesmia_K336	CGAA----TCGGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{673}
Acrorchis_399	-----AATATCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{669}
Jacquiniella_313	CGAA----TCGGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{673}
Hagsatera_229	GAA----TTCGG-T-AGA--CGA-TACGGACT-TGATTGG-ATT-GAG--	{676}
Homalopetalum_234	GAA-----TCGG-T-AGA--CGA-TACGGACT-TGATTGG-ATT-GAG--	{676}
Meiracyllium_trinas_129	-GAAA----TCGGT-AGA--CG-CTACGGACT-TGAT-GG-ATT-GAG--	{684}
Psy.mcconnelliae_W53R	-GGAA----TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{678}
Psy.krugii_62	-GGAA---TTCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{680}
Brough.nigrilensis_152	CAA----TTCGG-T-AGA--CGC-TACGGACT-TGATTGG-ATT-GAG--	{675}
Tetramica.elegans_160	GAA----TTCGG-T-AGA--CGA-TACGGACT-TGATTGG-ATT-GAG--	{679}
Domingoa_225	CAA----TTCGG-T-AGA--CGA-TACGGACT-TGATTGG-ATT-GAG--	{677}
Cattleyopsis_251	--------TTCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{679}
Brassav.cucullata_130	-GAAA----TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{674}
L.rubescens_w284	-AAAA----TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{669}
Myrmecophila_281	--------------------------CATCT-------G-ATT-GGA-T	{646}
C.dowiana_282	------------------------------CTCTGATTGG-AT--GAG--	{641}
Rhy.glauca_N134	CGAA----TCGGGT-AGA--CGGCTACGGACT--GATTGG-ATT-GAG--	{674}
C.forbesii_59	-------------------------------T-T--ATGG-AT--GAG--	{616}
Soph.cernua_145	-GAA----TCGGGT-AGA--CG-TTACGGACT-TGATTGG-ATT-GAG--	{673}
L.purpurata_84	-GAAA----TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{677}
Schm.splendida_280	-GAAA----TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{672}
E.citrina_54	GGAATTTTTTCGGT-AGA--CG-CTACAGACT-TGATTGG-AT--GAG--	{680}
E.mariae_56	GGAATTTTTTCGGT-AGA--CG-CTACAGACT-TGATTGG-ATTTGAG--	{657}
E.mariae_87	AA------TC?GGT-AGA--CG--TACGGACT-TGATTGG-ATT-GAG--	{675}
D.polybulbon_61	--	{633}
D.polybulbon_94	CGAAA----TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{671}
E.adenocaula_12	-------------------------C-GATC-TGATTGG-AT--GAG--	{656}
E.bractescens_21	---------TCG-T-AAGGACGGTTACGGACT-TGATTGG-ATT-GAG--	{675}
E.aromatica_02	-GAA----TTCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{683}
E.cordigera_24	CCAAATTTTTCGGT-AGA--CGGTTACGGAAT-TGATTGG-ATT-GAGG-	{684}
E.tampensis_27	--------TTCGGT-AGA--CGGTTACGGAAT-TGATTGG-ATT-GAG--	{678}
E.tampensis_alba_23	-GAAA---TTCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{681}
E.dichroma_74	----------------------------------GATTGG-AT-CGAT--	{656}
E.diurna_09	--------TTCGGT-AGA--CGGTTACGGAAT-TGATTGG-ATT-GAG--	{678}
E.asperula_65	-GAAA---TCGGGT-AGAA-CG-TTACGGACT-TGATTGG-ATT-GAG--	{679}
E.candollei_29	-----------------------TACAGACT-TGATTGG-ATT-GAG--	{666}
E.randii_50	-GAAAA---TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{681}
E.kienastii_235	--------ATCGGT-AGA--CGG-TACGGACT-TGATTGG-ATT-GAG--	{670}
P.chimborazoensis_51	-----------GGTTAGGA-CG--TACGGACT-TGATTGG-ATT-GAG--	{666}
P.fragrans_172	----------CGGT-AGA--CG-TTCCGGATT-TGATTGG-ATT-GAG--	{669}
P.aemula_17	-----------------------TACGGACCTTGATTGG-ATT-GAG--	{659}
P.cochleata_31	CGAA----TTCGGT-AGA--CGGCTACGGACT-TGATTGG-AT--GAG--	{677}
P.pygmaea_81	CGAAA----TCGGT-AGA--CGG-TACGGACT-TGATTGG-ATT-GAG--	{673}
P.pseudopygmaea_205	C?A----TTCGG-T-AGA--CGC-TACGGACT-TGATTGG-ATT-GAG--	{676}
P.vitellina_57	CGAAA----TCGGG-AGA--CG-ATACGGACT-TGATTGG-ATT-GAG--	{677}
P.glauca_176	CCAAA----TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{674}
P.ionocentra_46	-GAA-TAGTTCGGTTAGGA-CG--TACGGACT-TGATTGG-ATT-GAGG-	{679}
P.prismatocarpa_19	CGAAA---TTCGGT-AGA--CG-CTACCGACTCTGATGGG-ATT-GAG--	{679}
P.ochracea_95	----------------------------AAT-TGATTGG-ATT-GAG--	{652}
P.cretacea_230	CCAA----TCGG-T-AGA--CGC-TACGGACT-TGATTGG-ATT-GAG--	{675}
E.luteorosea_178	CGAAA----TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{673}
E.luteorosea_173	CCAAA----TCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{673}
E.subulatifolia_128	CGAA----TTCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{678}
E.subulatifolia_174	CGAA----TTCGGT-AGA--CG-CTACGGACT-TGATTGG-ATT-GAG--	{678}
E.cyanocolumna_1001	AA-----TCCGG-T-AGA--CGC-TACGGACT-TGATTGG-ATT-GAG--	{673}
E.tenuissima_143	--------------------------G-TT-TGATTGG-AT--GAG--	{650}

Appendix G—continued.

{	810 820 830 840 850}	
{	. . . . .}	
Restrepiella_291	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{706}
Pluer.racemiflora_140	-CCTT-AG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{710}
Ponera.striata_197	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{735}
Isochilis.major_279	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{703}
Epi.ibaguense_60	-CCTT-GGGTATGGAA-CCTGCT-AAGTGGTGAACTT-CC-AAATTCAG-	{721}
Epi.conopseum_244	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{712}
Nidema.boothii_192	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{713}
S._pulchella_W208	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{712}
H.imbricata_283	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTC-CC-AAATTCAG-	{714}
Reichenbachanthus_W107	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{715}
Hexadesmia_K336	-CCTT-GG-TATGGAAACCTGCTA-AGTGGT-AACTT-CC-AAATTCAG-	{715}
Acrorchis_399	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{711}
Jacquiniella_313	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{715}
Hagsatera_229	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{718}
Homalopetalum_234	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{718}
Meiracyllium_trinas_129	--CTT-GG-TATGGAAA-CTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{724}
Psy.mcconnelliae_W53R	-CCTT-GG-TATGGAAACCTACT-AAGTGGT-AACTT-CC-AAATTCAG-	{720}
Psy.krugii_62	-CCTT-GG-TATGGAAACCTACT-AAGTGGT-AACTT-CC-ACATTCAG-	{722}
Brough.nigrilensis_152	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{717}
Tetramica.elegans_160	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{721}
Domingoa_225	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{719}
Cattleyopsis_251	-CCTT-GG-TATGGAA-CCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{720}
Brassav.cucullata_130	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{716}
L.rubescens_w284	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{711}
Myrmecophila_281	CAGTTTGG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{690}
C.dowiana_282	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{683}
Rhy.glauca_N134	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{716}
C.forbesii_59	-CCTT-GC-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{658}
Soph.cernua_145	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{715}
L.purpurata_84	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{719}
Schm.splendida_280	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{714}
E.citrina_54	-CCTGCGG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{723}
E.mariae_56	-CCTGCGG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{700}
E.mariae_87	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{717}
D.polybulbon_61	----------------------------------AACTTTCC-ARTTTCAGG	{650}
D.polybulbon_94	--CTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{712}
E.adenocaula_12	--CTT-GG-TATGGAKA-CTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{696}
E.bractescens_21	-CCTTCGG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{718}
E.aromatica_02	-CCTT-GG-TATGGAA-CCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{724}
E.cordigera_24	-CCTT-GG-TATGGAAACCTGCT-AAGTGAT-AACTT-CC-AAATTCAG-	{726}
E.tampensis_27	-CCTT-GG-TATGGAA-CCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{719}
E.tampensis_alba_23	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CCA-AATTCAG-	{723}
E.dichroma_74	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{698}
E.diurna_09	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{720}
E.asperula_65	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{721}
E.candollei_29	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{708}
E.randii_50	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{723}
E.kienastii_235	-CCTT-GG-TATGGAAACCTGC--AAGTGGT-AACTT-CC-AAATTCAG-	{711}
P.chimborazoensis_51	--CTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{707}
P.fragrans_172	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{711}
P.aemula_17	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AAATT-CC-AAATTCAG-	{701}
P.cochleata_31	--CTT-GG-TATGGAA-CCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{717}
P.pygmaea_81	CCT-T-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{715}
P.pseudopygmaea_205	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{718}
P.vitellina_57	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{719}
P.glauca_176	CCTAT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{717}
P.ionocentra_46	-CCTT-GG-TATGGAACCCTGCTTAAGTGGT-AACTT-CCCAAATTCAG-	{723}
P.prismatocarpa_19	--CTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{720}
P.ochracea_95	CCCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{695}
P.cretacea_230	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{717}
E.luteorosea_178	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{715}
E.luteorosea_173	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{715}
E.subulatifolia_128	-CCTT-GG-TATGGAAASSTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{720}
E.subulatifolia_174	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{720}
E.cyanocolumna_1001	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{715}
E.tenuissima_143	-CCTT-GG-TATGGAAACCTGCT-AAGTGGT-AACTT-CC-AAATTCAG-	{692}

Appendix G—continued.

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{                                              860       870       880       890       900}
{                                                .         .         .         .         .}
Restrepiella_291                 AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {751}
Pluer.racemiflora_140            AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {755}
Ponera.striata_197               AGAAA--CCCTGG-AACTAAAAAA-GGGCAATCC-TGAGCCAAATCTTTG   {780}
Isochilis.major_279              AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {748}
Epi.ibaguense_60                 AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {766}
Epi.conopseum_244                AGAAA--CCCTGG-AAATAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {757}
Nidema.boothii_192               AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {758}
S._pulchella_W208                AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {757}
H.imbricata_283                  AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {759}
Reichenbachanthus_W107           AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {760}
Hexadesmia_K336                  AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {760}
Acrorchis_399                    AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {756}
Jacquiniella_313                 AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {760}
Hagsatera_229                    AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {763}
Homalopetalum_234                AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {763}
Meiracyllium_trinas_129          AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {769}
Psy.mcconnelliae_W53R            AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCCCTGAGCCAAATCTTTG   {766}
Psy.krugii_62                    AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {767}
Brough.nigrilensis_152           AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {762}
Tetramica.elegans_160            AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {766}
Domingoa_225                     AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {764}
Cattleyopsis_251                 AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {765}
Brassav.cucullata_130            AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {761}
L.rubescens_w284                 AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {756}
Myrmecophila_281                 AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {735}
C.dowiana_282                    AGAAA--CCCTGGAAACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {729}
Rhy.glauca_N134                  AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {761}
C.forbesii_59                    AGAAA--CCCTGG?AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {704}
Soph.cernua_145                  AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {760}
L.purpurata_84                   AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {764}
Schm.splendida_280               AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {759}
E.citrina_54                     AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {768}
E.mariae_56                      AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {745}
E.mariae_87                      AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {762}
D.polybulbon_61                  AGAAA-CCCCWGG-AACTAAAGARTGGGCAWTCC-TGAGCCAGTTTTTTG   {697}
D.polybulbon_94                  AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {757}
E.adenocaula_12                  AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {741}
E.bractescens_21                 AGAAA--CCCAGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {763}
E.aromatica_02                   AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {769}
E.cordigera_24                   AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {771}
E.tampensis_27                   AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {764}
E.tampensis_alba_23              AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {768}
E.dichroma_74                    AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {743}
E.diurna_09                      AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {765}
E.asperula_65                    AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {766}
E.candollei_29                   AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {753}
E.randii_50                      AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {768}
E.kienastii_235                  AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {756}
P.chimborazoensis_51             AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {752}
P.fragrans_172                   AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {756}
P.aemula_17                      AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {746}
P.cochleata_31                   AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {762}
P.pygmaea_81                     AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {760}
P.pseudopygmaea_205              AGAAA--CCCTGG-AACTAAAAG-TGGGCAATCC-TGAGCCAAATCTTTT   {763}
P.vitellina_57                   AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {764}
P.glauca_176                     AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {762}
P.ionocentra_46                  AGGAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {768}
P.prismatocarpa_19               AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {765}
P.ochracea_95                    AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {740}
P.cretacea_230                   AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {762}
E.luteorosea_178                 AGAAA--CCCTGG-AATTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {760}
E.luteorosea_173                 AGAAA--CCCTGG-AATTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTT   {760}
E.subulatifolia_128              AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {765}
E.subulatifolia_174              AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {765}
E.cyanocolumna_1001              AGAAA--CCCTGG-AACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {760}
E.tenuissima_143                 AGAAA--CCCTGGGAACTAAAAA-TGGGCAATCC-TGAGCCAAATCTTTG   {738}
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Appendix G—continued.

{	910 920 930 940 950}	
{	. . . . .}	
Restrepiella_291	TTTTTTT--AGAGAAA----AAACGATGGAAAATGAGA-GAAAAAGGGGA	{794}
Pluer.racemiflora_140	TTTT----GAAAGAAG----AAACGATGGAAAATGAGAAGAAAAA-GGGA	{796}
Ponera.striata_197	TTTT----GAGAGAAA----AAATGATATAAAATGAGAAGAAAAA-GGGA	{821}
Isochilis.major_279	TTTT----GAGAGAAA----AAATGATATAAAATGAGAATAAAAA-GGGA	{789}
Epi.ibaguense_60	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{807}
Epi.conopseum_244	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{798}
Nidema.boothii_192	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAAGAAAAA-GGGA	{799}
S._pulchella_W208	TTTT----GAGAGAAA----AAACGATGGAAAATTAGAATAAAAA-GGGA	{798}
H.imbricata_283	TTTT----GAGAGAAA----AAACGATGGAAAATTAGAATAAAAA-GGGA	{800}
Reichenbachanthus_W107	TTTT----GAGAGAAA----------------ATTAGAATAAAAA-GGGA	{789}
Hexadesmia_K336	TTTT----GAGAGAAA----AAACGATGGAAAATTAGAATAAAAA-GGGA	{801}
Acrorchis_399	TTTT----GAGAGAAA----AAACGATGGAAAATTAGAATAAAAA-GGGA	{797}
Jacquiniella_313	TTTT----GAGAGAAA----AAACGATGGAAAATTAGAATAAAAA-GGGA	{801}
Hagsatera_229	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{804}
Homalopetalum_234	TTTTT---GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{805}
Meiracyllium_trinas_129	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{810}
Psy.mcconnelliae_W53R	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{807}
Psy.krugii_62	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{808}
Brough.nigrilensis_152	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{803}
Tetramica.elegans_160	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{807}
Domingoa_225	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GAGA	{805}
Cattleyopsis_251	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{806}
Brassav.cucullata_130	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{802}
L.rubescens_w284	TTTT----GAGAGAAA-----AACGATGGAAAATGAGAATAAAAA-GGGA	{796}
Myrmecophila_281	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{776}
C.dowiana_282	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{770}
Rhy.glauca_N134	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{802}
C.forbesii_59	TTTT----GAGAGAA----AAAACGATGGAAAATGAGAATAAAAA-GGGA	{745}
Soph.cernua_145	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{801}
L.purpurata_84	TTTT----GAGAGAA----AAAACGATGGAAAATGAGAATAAAAA-GGGA	{805}
Schm.splendida_280	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{800}
E.citrina_54	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{809}
E.mariae_56	TTTTT----AGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{786}
E.mariae_87	TTTTT----AGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{803}
D.polybulbon_61	TTGTT---GGGAGAAA----AAACGATGGAAAGTGAGAATAAAAAGGGGA	{740}
D.polybulbon_94	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{798}
E.adenocaula_12	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{782}
E.bractescens_21	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{804}
E.aromatica_02	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{810}
E.cordigera_24	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{812}
E.tampensis_27	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{805}
E.tampensis_alba_23	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{809}
E.dichroma_74	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{784}
E.diurna_09	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{806}
E.asperula_65	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{807}
E.candollei_29	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{794}
E.randii_50	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{805}
E.kienastii_235	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{797}
P.chimborazoensis_51	TTTTTT--GAGAGAAA----AA----TGGAAAATGAGAATAAAAA-GGGA	{791}
P.fragrans_172	TTTTTT--GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{799}
P.aemula_17	TTTTTTT-GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{790}
P.cochleata_31	TTTTT---GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{804}
P.pygmaea_81	TTTTTTT--AGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{803}
P.pseudopygmaea_205	TTTTTT---AGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{805}
P.vitellina_57	TTTTTT--GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{807}
P.glauca_176	TTTTTTT-GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{806}
P.ionocentra_46	TTTT----GAGAGAAA----AAACGGTGGAAAATGAGAATAAAAA-GGGA	{809}
P.prismatocarpa_19	TTTTTT--GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{808}
P.ochracea_95	TTTTTTTTGAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{785}
P.cretacea_230	TTTTT---GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{804}
E.luteorosea_178	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{801}
E.luteorosea_173	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{801}
E.subulatifolia_128	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GAGA	{806}
E.subulatifolia_174	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GAGA	{806}
E.cyanocolumna_1001	TTTT----GAGAAAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{801}
E.tenuissima_143	TTTT----GAGAGAAA----AAACGATGGAAAATGAGAATAAAAA-GGGA	{779}

Appendix G—continued.

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{                                          960       970       980       990      1000}
{                                            .         .         .         .         .}
Restrepiella_291          TAGGTGCAGAGACTCAA-TGGARTTTGTTCTAACGAATGAAATTGACTAC  {843}
Pluer.racemiflora_140     TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {845}
Ponera.striata_197        TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {870}
Isochilis.major_279       TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {838}
Epi.ibaguense_60          TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {856}
Epi.conopseum_244         TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {847}
Nidema.boothii_192        TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {848}
S._pulchella_W208         TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {847}
H.imbricata_283           TAGGTGCAGAGACTCAA-TGGAAGTTGTTCTAACGAATGAAATTGACTAC  {849}
Reichenbachanthus_W107    TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATTAAATTGACTAC  {838}
Hexadesmia_K336           TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {850}
Acrorchis_399             TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {846}
Jacquiniella_313          TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {850}
Hagsatera_229             TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {853}
Homalopetalum_234         TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {854}
Meiracyllium_trinas_129   TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {859}
Psy.mcconnelliae_W53R     TAGGTGCAGAGACTCAA-TGGAAGTTGTTCTAACGAATGAAATTGACTAC  {856}
Psy.krugii_62             TAGGTGCAGAGACTCAA-TGGAAGTTGTTCTAACGAATGAAATTGACTAC  {857}
Brough.nigrilensis_152    TAGGTGCAGAGACTCAA-TGGAAGTTGTTCTAACGAATGAAATTGACTAC  {852}
Tetramica.elegans_160     TAGGTGCAGAGACTCAA-TGGAAGTTGTTCTAACGAATGAAATTGACTAC  {856}
Domingoa_225              TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {854}
Cattleyopsis_251          TAGGTGCAGAGACTCAA-TGGAAGTTGTTCTAACGAATGAAATTGACTAC  {855}
Brassav.cucullata_130     TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {851}
L.rubescens_w284          TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {845}
Myrmecophila_281          TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {825}
C.dowiana_282             TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {819}
Rhy.glauca_N134           TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {851}
C.forbesii_59             TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {794}
Soph.cernua_145           TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {850}
L.purpurata_84            TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {854}
Schm.splendida_280        TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {849}
E.citrina_54              TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {858}
E.mariae_56               TAGGTGCAGAGACTCAA-TGGAAGTTGTTCTAACGAATGAAATTGACTAC  {835}
E.mariae_87               TAGGTGCAGAGACTCAA-TGGAAGTTGTTCTAACGAATGAAATTGACTAC  {852}
D.polybulbon_61           TAGGTGCAGAGACTCAAATGGAAGCTGTTCTAACGAATGAAATKGASTAC  {790}
D.polybulbon_94           TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {847}
E.adenocaula_12           TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {831}
E.bractescens_21          TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {853}
E.aromatica_02            TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {859}
E.cordigera_24            TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {861}
E.tampensis_27            TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {854}
E.tampensis_alba_23       TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {858}
E.dichroma_74             TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {833}
E.diurna_09               TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {855}
E.asperula_65             TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {856}
E.candollei_29            TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {843}
E.randii_50               TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {858}
E.kienastii_235           TAGGTGCAGAGACTCAA-TGGAAGTTGTTCTAACGAATGAAATTGACTAC  {846}
P.chimborazoensis_51      TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {840}
P.fragrans_172            TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {848}
P.aemula_17               TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {839}
P.cochleata_31            TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAGATTGACTAC  {853}
P.pygmaea_81              TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAGATTGACTAC  {852}
P.pseudopygmaea_205       TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAGATTGACTAC  {854}
P.vitellina_57            TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {856}
P.glauca_176              TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {855}
P.ionocentra_46           TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {858}
P.prismatocarpa_19        TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {857}
P.ochracea_95             TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {834}
P.cretacea_230            TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {853}
E.luteorosea_178          TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {850}
E.luteorosea_173          TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {850}
E.subulatifolia_128       TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {855}
E.subulatifolia_174       TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {855}
E.cyanocolumna_1001       TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {850}
E.tenuissima_143          TAGGTGCAGAGACTCAA-TGGAAGCTGTTCTAACGAATGAAATTGACTAC  {828}
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Appendix G—continued.

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{                                            1010      1020      1030      1040      1050}
{                                               .         .         .         .         .}
Restrepiella_291               GTTACGTACGTCACGTTAGTAGCTTAAATCCTTCTATCG-AAATGAAAGA   {892}
Pluer.racemiflora_140          GTTACGTACGTTACGTTAGTAGCTAAAATCTTTCTATCG-AAATGACAAA   {894}
Ponera.striata_197             GTTAC---------GTTAGTAGCTAAAATCCTTCTATCG-AAATGACAGA   {910}
Isochilis.major_279            GTTAC---------GTTAGTAGCTAAAATCCTTCTATCG-AAATGACAGA   {878}
Epi.ibaguense_60               GTTAC---------GTTAGTAGCTAAAACCTTTCTATCG-AAATGACAGA   {896}
Epi.conopseum_244              GTTAC---------GTTAGTAGCTAAAAACCTTCTATCG-AAATGACAGA   {887}
Nidema.boothii_192             GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {888}
S._pulchella_W208              GTTAC---------GTT-------AAAACCCTTCTATCG-AAATGACAGA   {880}
H.imbricata_283                GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {889}
Reichenbachanthus_W107         GTTAC---------GTTAGTAGCTAAAAACCTTCTATCG-AAATGACAGA   {878}
Hexadesmia_K336                GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {890}
Acrorchis_399                  GTTAC---------GTTAGTAGCTAAAAACCTTCTATCG-AAATGACAGA   {886}
Jacquiniella_313               GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {890}
Hagsatera_229                  GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {893}
Homalopetalum_234              GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {894}
Meiracyllium_trinas_129        GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATAAAAGA   {899}
Psy.mcconnelliae_W53R          GTTAC---------GTTAGTAGCTAAAACCCTTCTATCGG-AATGACAGA   {896}
Psy.krugii_62                  GTTAC---------GTTAGTAGCTAAAACCCTTCTATCGG-AATGACAGA   {897}
Brough.nigrilensis_152         GTTAC---------ATTAGTAGCTAAAACCCTTCTATCG-GAATGACAGA   {892}
Tetramica.elegans_160          GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-GAATGACAGA   {896}
Domingoa_225                   GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {894}
Cattleyopsis_251               GTTAC---------GTTAGTAGCTAAAACCCTTCTATCGG-AATGACAGA   {895}
Brassav.cucullata_130          GTTAC---------ATTAGTAGCTAAAAACCTTCTATCG-AAATGACAGA   {891}
L.rubescens_w284               GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {885}
Myrmecophila_281               GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {865}
C.dowiana_282                  GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {859}
Rhy.glauca_N134                GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {891}
C.forbesii_59                  GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {834}
Soph.cernua_145                GTTAC---------GTTAGTAGCTAAAACCCTTCTATCA-AAATGACAGA   {890}
L.purpurata_84                 GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {894}
Schm.splendida_280             GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {889}
E.citrina_54                   GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {898}
E.mariae_56                    GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {875}
E.mariae_87                    GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {892}
D.polybulbon_61                GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {830}
D.polybulbon_94                GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {887}
E.adenocaula_12                GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {871}
E.bractescens_21               GTTAC---------GTTAGTAGCTAAAACCCTTCTATCGCAAATGACAGA   {894}
E.aromatica_02                 GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {899}
E.cordigera_24                 GTTAC---------GTTAGTAGCTAAAAACCTTCTATCG-AAATGACAGA   {901}
E.tampensis_27                 GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {894}
E.tampensis_alba_23            GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {898}
E.dichroma_74                  GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {873}
E.diurna_09                    GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {895}
E.asperula_65                  GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {896}
E.candollei_29                 GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {883}
E.randii_50                    GTTAC------TACGTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {901}
E.kienastii_235                GTTAC---------GTTAGTAACTAAAACCCTTCTATCG-AAATGACAGA   {886}
P.chimborazoensis_51           GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {880}
P.fragrans_172                 GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {888}
P.aemula_17                    GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {879}
P.cochleata_31                 GTTAC---------GCTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {893}
P.pygmaea_81                   GTTAC---------GCTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {892}
P.pseudopygmaea_205            GTTAC---------GCTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {894}
P.vitellina_57                 GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {896}
P.glauca_176                   GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {895}
P.ionocentra_46                GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {898}
P.prismatocarpa_19             TTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {897}
P.ochracea_95                  GTTAC---------GTTAGTAGCTAAAACCCTTCTATC-AAAATGACAGA   {874}
P.cretacea_230                 GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {893}
E.luteorosea_178               GTTAC---------GTTAGTAGCTAAAAACCTTCTATCG-AAATGACAGA   {890}
E.luteorosea_173               GTTAC---------GTTAGTAGCTAAAAACCTTCTATCG-AAATGACAGA   {890}
E.subulatifolia_128            GTTAC---------GTTAGTAGCTAAAAACCTTCTATCG-AAATGACAGA   {895}
E.subulatifolia_174            GTTAC---------GTTAGTAGCTAAAAACCTTCTATCG-AAATGACAGA   {895}
E.cyanocolumna_1001            GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGACAGA   {890}
E.tenuissima_143               GTTAC---------GTTAGTAGCTAAAACCCTTCTATCG-AAATGAAAGA   {868}
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Appendix G—continued.

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{                                        1060      1070      1080      1090      1100}
{                                           .         .         .         .         .}
Restrepiella_291              AAAAGAAAGGATAACCTTTATATACCTAATA--------CGTACGTATAC    {934}
Pluer.racemiflora_140         AA------GGATAACATT-ATATATCTAATA--------CGTACGTATAC    {929}
Ponera.striata_197            AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {945}
Isochilis.major_279           AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {913}
Epi.ibaguense_60              AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {931}
Epi.conopseum_244             AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {922}
Nidema.boothii_192            AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {923}
S._pulchella_W208             AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {915}
H.imbricata_283               AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {924}
Reichenbachanthus_W107        AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {913}
Hexadesmia_K336               AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {925}
Acrorchis_399                 AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {921}
Jacquiniella_313              AA------GGATAATCTT-ATATACCTAATA--------CGTACGTATAC    {925}
Hagsatera_229                 AA------GGATAACCTT-ATATACCTAAGA--------CGTACGTATAC    {928}
Homalopetalum_234             AA------GGATAACCTT-ATATATCTAATAATCTAATACGTACGTATAC    {937}
Meiracyllium_trinas_129       AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {934}
Psy.mcconnelliae_W53R         AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {931}
Psy.krugii_62                 AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {932}
Brough.nigrilensis_152        AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {927}
Tetramica.elegans_160         AA------GGATAACCTT-ATATACCTAATA--------TGTACGTATAC    {931}
Domingoa_225                  AA------GGATAACCTT-ATATATCTAATA--------CGTACGTATAC    {929}
Cattleyopsis_251              AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {930}
Brassav.cucullata_130         AA------GGAAAACCTT-ATATACCTAATA--------CGTACGTATAC    {926}
L.rubescens_w284              AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {920}
Myrmecophila_281              AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {900}
C.dowiana_282                 AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {894}
Rhy.glauca_N134               AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {926}
C.forbesii_59                 AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {869}
Soph.cernua_145               AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAA    {925}
L.purpurata_84                AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {929}
Schm.splendida_280            AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {924}
E.citrina_54                  AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {933}
E.mariae_56                   AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {910}
E.mariae_87                   AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {927}
D.polybulbon_61               AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {865}
D.polybulbon_94               AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {922}
E.adenocaula_12               AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {906}
E.bractescens_21              AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {929}
E.aromatica_02                AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {934}
E.cordigera_24                AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {936}
E.tampensis_27                AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {929}
E.tampensis_alba_23           AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {933}
E.dichroma_74                 AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {908}
E.diurna_09                   AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {930}
E.asperula_65                 AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {931}
E.candollei_29                AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {918}
E.randii_50                   AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {936}
E.kienastii_235               AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {921}
P.chimborazoensis_51          AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {915}
P.fragrans_172                AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {923}
P.aemula_17                   AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {914}
P.cochleata_31                AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {928}
P.pygmaea_81                  AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {927}
P.pseudopygmaea_205           AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {929}
P.vitellina_57                AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {931}
P.glauca_176                  AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {930}
P.ionocentra_46               AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {933}
P.prismatocarpa_19            AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {932}
P.ochracea_95                 AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {909}
P.cretacea_230                AA------GGATAATCTT-ATATATCTAATA--------CGTACGTATAC    {928}
E.luteorosea_178              AA------GGATAACCTT-ATATACCTAATG--------CGTACGTATAC    {925}
E.luteorosea_173              AA------GGATAACCTT-ATATACCTAATG--------CGTACGTATAC    {925}
E.subulatifolia_128           AG------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {930}
E.subulatifolia_174           AG------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {930}
E.cyanocolumna_1001           AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {925}
E.tenuissima_143              AA------GGATAACCTT-ATATACCTAATA--------CGTACGTATAC    {903}
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Appendix G—continued.

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{                                     1110      1120      1130      1140      1150}
{                                        .         .         .         .         .}
Restrepiella_291            ATACTGATATAGCAAACGATTAATCAC----AACCCAAATCTTC-TATC-   {978}
Pluer.racemiflora_140       ATACTGATATAGCAAACGATTAATCAC----AATCCAAATCTTC-TATT-   {973}
Ponera.striata_197          ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-GATC-   {989}
Isochilis.major_279         ATGCTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-GATC-   {957}
Epi.ibaguense_60            ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {975}
Epi.conopseum_244           ATACTGACATAGCAAACGATTAATCAC--------AAAATCTTA-TATC-   {962}
Nidema.boothii_192          ATACTGGCATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {967}
S._pulchella_W208           ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {959}
H.imbricata_283             ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATT-   {968}
Reichenbachanthus_W107      ATACTGACATAGCAAACGATTAATAAC----AACCCAAATCTTA-TATC-   {957}
Hexadesmia_K336             ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATT-   {969}
Acrorchis_399               ATACTGACATAGCAAACGATTAATCAC----AACCCCAATCTTA-TAAG-   {965}
Jacquiniella_313            ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATT-   {969}
Hagsatera_229               ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {972}
Homalopetalum_234           ATACTTACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {981}
Meiracyllium_trinas_129     ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TCTC-   {978}
Psy.mcconnelliae_W53R       ATATTGACATAGCAAACGATTAATCACACACAACCCAAATCTTA-TATC-   {979}
Psy.krugii_62               ATATTGACATAGCAAACGATTAATCACACACAACCCAAATCTTA-TATC-   {980}
Brough.nigrilensis_152      ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {971}
Tetramica.elegans_160       ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {975}
Domingoa_225                ATACTGACATAGCAAACGATTAATCAC----AACCAAAATCTTA-TATT-   {973}
Cattleyopsis_251            ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {974}
Brassav.cucullata_130       ATATTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATT-   {970}
L.rubescens_w284            ATACTAACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {964}
Myrmecophila_281            ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {944}
C.dowiana_282               ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATT-   {938}
Rhy.glauca_N134             ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {970}
C.forbesii_59               ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATT-   {913}
Soph.cernua_145             ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATT-   {969}
L.purpurata_84              ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {973}
Schm.splendida_280          ATACTAACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {968}
E.citrina_54                ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATC-   {977}
E.mariae_56                 ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATT-   {954}
E.mariae_87                 ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATT-   {971}
D.polybulbon_61             ATACTGGCATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATT-   {909}
D.polybulbon_94             ATACTGGCATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATT-   {966}
E.adenocaula_12             ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {950}
E.bractescens_21            ATACTGACATAGCAAACGATTAATCAC----AACCCATATCTTACTATC-   {974}
E.aromatica_02              ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {978}
E.cordigera_24              ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATT-   {980}
E.tampensis_27              ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {973}
E.tampensis_alba_23         ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {977}
E.dichroma_74               ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {952}
E.diurna_09                 ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATCG   {975}
E.asperula_65               ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {975}
E.candollei_29              ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {962}
E.randii_50                 ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {980}
E.kienastii_235             ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATT-   {965}
P.chimborazoensis_51        ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATC-   {959}
P.fragrans_172              ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATC-   {967}
P.aemula_17                 ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATC-   {958}
P.cochleata_31              ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATC-   {972}
P.pygmaea_81                ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATC-   {971}
P.pseudopygmaea_205         ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATC-   {973}
P.vitellina_57              ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATT-   {975}
P.glauca_176                ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATT-   {974}
P.ionocentra_46             ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATT-   {977}
P.prismatocarpa_19          ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATT-   {976}
P.ochracea_95               ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATC-   {953}
P.cretacea_230              ATACTGACATAGCAAATGATTAATCAC----AACCCAAATCTTA-TATG-   {972}
E.luteorosea_178            ATACTGACATAGCAAACGATTAATCAC----AACCTAAATCTTA-TATT-   {969}
E.luteorosea_173            ATACTGACATAGCAAACGATTAATCAC----AACCTAAATCTTA-TATT-   {969}
E.subulatifolia_128         ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {974}
E.subulatifolia_174         ATACTGACATAGCAAACGATTAATCAC----AACCCAAATCTTA-TATC-   {974}
E.cyanocolumna_1001         ATACTGACATAGCAAACTATTAATCAC----AACCAAAATCTTA-TATT-   {969}
E.tenuissima_143            ATACTGACATAGCAAACTATTAATCAC----AACCCAAATCTTA-TATT-   {947}
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Appendix G—continued.

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{                                                1160      1170      1180      1190      1200}
{                                                   .         .         .         .         .}
Restrepiella_291                       -GAATCCTATTCT-GTATCTCTATATATGAAAATGAAAAGAAAAATCTTC   {1026}
Pluer.racemiflora_140                  ---------------------------------------------TCTTC   {978}
Ponera.striata_197                     -AAATCCTATTCT-GTATCTCTATATATGAAAAT------AGAAATCTTC   {1031}
Isochilis.major_279                    -GAATCCTATTCT-GTATCTCTATATATGAAAAT------AGAAATCTTC   {999}
Epi.ibaguense_60                       -GAATC--------GTAT--------------------------------   {984}
Epi.conopseum_244                      -GAATCATATTATAGTAT--------------------------------   {979}
Nidema.boothii_192                     -GAATCCTATTATAGTAT--------------------------------   {984}
S._pulchella_W208                      -GAATCCTATTATAGTAT--------------------------------   {976}
H.imbricata_283                        -GAATCCTATTATAGTAT--------------------------------   {985}
Reichenbachanthus_W107                 -GAATCCTATTATAGTAT--------------------------------   {974}
Hexadesmia_K336                        -GAATCCTATTATAGTAT--------------------------------   {986}
Acrorchis_399                          -GAATCCTATTCTAGTAT--------------------------------   {982}
Jacquiniella_313                       -GAATCCTATTCTAGTAT--------------------------------   {986}
Hagsatera_229                          -GAATCCTATTATAGTAT--------------------------------   {989}
Homalopetalum_234                      -GAATCCTATTATACTAT--------------------------------   {998}
Meiracyllium_trinas_129                -GAATCCTATTATAGTATATTATAGTAT----------------------   {1005}
Psy.mcconnelliae_W53R                  -GAATCCTATTATAGTAT--------------------------------   {996}
Psy.krugii_62                          -GAATCCTATTATAGTAT--------------------------------   {997}
Brough.nigrilensis_152                 -GAATCCTATTATAGTAT--------------------------------   {988}
Tetramica.elegans_160                  -GAATCCTATTATAGTAT--------------------------------   {992}
Domingoa_225                           -GAATCCTATTATAGTAT--------------------------------   {990}
Cattleyopsis_251                       -GAATCCTATTATAGTAT--------------------------------   {991}
Brassav.cucullata_130                  -GAATCCTATTATAGTAT--------------------------------   {987}
L.rubescens_w284                       -GAATCCTATTATAGTAT--------------------------------   {981}
Myrmecophila_281                       -GAATCCTATTATAGTAT--TATAGTAT----------------------   {969}
C.dowiana_282                          -GAATCCTATTATAGTAT--------------------------------   {955}
Rhy.glauca_N134                        -GAATCCTATTATAGTAT--------------------------------   {987}
C.forbesii_59                          -GAATCCTATTATAGTAT--------------------------------   {930}
Soph.cernua_145                        -GAATCCTATTATAGTAT--------------------------------   {986}
L.purpurata_84                         -GAATCCTATTATAGTAT--------------------------------   {990}
Schm.splendida_280                     -GAATCCTATTATAGTAT--------------------------------   {985}
E.citrina_54                           -GAATCCTATTATAGTAT--------------------------------   {994}
E.mariae_56                            -GAATCCTATTATAGTAT--------------------------------   {971}
E.mariae_87                            -GAATCCTATTATAGTAT--------------------------------   {988}
D.polybulbon_61                        -GAATCCTATTATAGTAT--------------------------------   {926}
D.polybulbon_94                        -GAATCCTATTATAGTAT--------------------------------   {983}
E.adenocaula_12                        -GAATCCTATTATAGTAT--------------------------------   {967}
E.bractescens_21                       -GAATCCTATTATAGTAT--------------------------------   {991}
E.aromatica_02                         -GAATCCTATTATAGTAT--------------------------------   {995}
E.cordigera_24                         -GAATCCTATTATAGTAT--------------------------------   {997}
E.tampensis_27                         -GAATCCTATTATAGTAT--------------------------------   {990}
E.tampensis_alba_23                    -GAATCCTATTATAGTAT--------------------------------   {994}
E.dichroma_74                          -GAATCCTATTATAGTAT--------------------------------   {969}
E.diurna_09                            AGAATCCTATTATAGTAT--------------------------------   {993}
E.asperula_65                          -GAATCCTATTATAGTAT--------------------------------   {992}
E.candollei_29                         -GAATCCTATTATAGTAT--------------------------------   {979}
E.randii_50                            -GAATCCTATTATAGTAT--------------------------------   {997}
E.kienastii_235                        -GAATCCTATTATAGTAT--------------------------------   {982}
P.chimborazoensis_51                   -GAATCCTATTATAGTAT--------------------------------   {976}
P.fragrans_172                         -GAATCCTATTATAGTAT--------------------------------   {984}
P.aemula_17                            -GAATCCTATTATAGTAT--------------------------------   {975}
P.cochleata_31                         -GAATCCTATTATAGTAT--------------------------------   {989}
P.pygmaea_81                           -GAATCCTATTATAGTAT--------------------------------   {988}
P.pseudopygmaea_205                    -GAATCCTATTATAGTAT--------------------------------   {990}
P.vitellina_57                         -GAATCCTATTATAGTAT--------------------------------   {992}
P.glauca_176                           -GAATCCTATTATAGTAT--------------------------------   {991}
P.ionocentra_46                        -GAATCCTATTATAGTAT--------------------------------   {994}
P.prismatocarpa_19                     -GAATCCTATTATAGTAT--------------------------------   {993}
P.ochracea_95                          -GAATCCTATTATAGTAG--------------------------------   {970}
P.cretacea_230                         -GAATCCTATTATAGTAT--------------------------------   {989}
E.luteorosea_178                       -GAATCCTATTATAGTAT--------------------------------   {986}
E.luteorosea_173                       -GAATCCTATTATAGTAT--------------------------------   {986}
E.subulatifolia_128                    -GAATCCTATTATAGTAT--------------------------------   {991}
E.subulatifolia_174                    -GAATCCTATTATAGTAT--------------------------------   {991}
E.cyanocolumna_1001                    -GAATCCTATTATAGTAT--------------------------------   {986}
E.tenuissima_143                       -GAATCCTATTA--------------------------------------   {958}
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Appendix G—continued.

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{                                                 1210      1220      1230      1240      1250}
{                                                    .         .         .         .         .}
Restrepiella_291            T---------------ATTTCTTTAGATTCTAGATTCTTTCTATTATAGA   {1061}
Pluer.racemiflora_140       TTTCTTTCTATTTCTTCTTTCTTTATATTCTAGATTATTTCTATTCTAGA   {1028}
Ponera.striata_197          T--------ATTTCTTATTTCTTTATA-------TTATTTTCT-ATAGAT   {1065}
Isochilis.major_279         T--------ATTTCTTATTTCTTTATA-------TTCTTTTCT-ATAGAT   {1033}
Epi.ibaguense_60            --------------------------------------------------   {984}
Epi.conopseum_244           --------------------------------------------------   {979}
Nidema.boothii_192          --------------------------------------------------   {984}
S._pulchella_W208           --------------------------------------------------   {976}
H.imbricata_283             --------------------------------------------------   {985}
Reichenbachanthus_W107      --------------------------------------------------   {974}
Hexadesmia_K336             --------------------------------------------------   {986}
Acrorchis_399               --------------------------------------------------   {982}
Jacquiniella_313            --------------------------------------------------   {986}
Hagsatera_229               --------------------------------------------------   {989}
Homalopetalum_234           --------------------------------------------------   {998}
Meiracyllium_trinas_129     --------------------------------------------------   {1005}
Psy.mcconnelliae_W53R       --------------------------------------------------   {996}
Psy.krugii_62               --------------------------------------------------   {997}
Brough.nigrilensis_152      --------------------------------------------------   {988}
Tetramica.elegans_160       --------------------------------------------------   {992}
Domingoa_225                --------------------------------------------------   {990}
Cattleyopsis_251            --------------------------------------------------   {991}
Brassav.cucullata_130       --------------------------------------------------   {987}
L.rubescens_w284            --------------------------------------------------   {981}
Myrmecophila_281            --------------------------------------------------   {969}
C.dowiana_282               --------------------------------------------------   {955}
Rhy.glauca_N134             --------------------------------------------------   {987}
C.forbesii_59               --------------------------------------------------   {930}
Soph.cernua_145             --------------------------------------------------   {986}
L.purpurata_84              --------------------------------------------------   {990}
Schm.splendida_280          --------------------------------------------------   {985}
E.citrina_54                --------------------------------------------------   {994}
E.mariae_56                 --------------------------------------------------   {971}
E.mariae_87                 --------------------------------------------------   {988}
D.polybulbon_61             --------------------------------------------------   {926}
D.polybulbon_94             --------------------------------------------------   {983}
E.adenocaula_12             --------------------------------------------------   {967}
E.bractescens_21            --------------------------------------------------   {991}
E.aromatica_02              --------------------------------------------------   {995}
E.cordigera_24              --------------------------------------------------   {997}
E.tampensis_27              --------------------------------------------------   {990}
E.tampensis_alba_23         --------------------------------------------------   {994}
E.dichroma_74               --------------------------------------------------   {969}
E.diurna_09                 --------------------------------------------------   {993}
E.asperula_65               --------------------------------------------------   {992}
E.candollei_29              --------------------------------------------------   {979}
E.randii_50                 --------------------------------------------------   {997}
E.kienastii_235             --------------------------------------------------   {982}
P.chimborazoensis_51        --------------------------------------------------   {976}
P.fragrans_172              --------------------------------------------------   {984}
P.aemula_17                 --------------------------------------------------   {975}
P.cochleata_31              --------------------------------------------------   {989}
P.pygmaea_81                --------------------------------------------------   {988}
P.pseudopygmaea_205         --------------------------------------------------   {990}
P.vitellina_57              --------------------------------------------------   {992}
P.glauca_176                --------------------------------------------------   {991}
P.ionocentra_46             --------------------------------------------------   {994}
P.prismatocarpa_19          --------------------------------------------------   {993}
P.ochracea_95               --------------------------------------------------   {970}
P.cretacea_230              --------------------------------------------------   {989}
E.luteorosea_178            --------------------------------------------------   {986}
E.luteorosea_173            --------------------------------------------------   {986}
E.subulatifolia_128         --------------------------------------------------   {991}
E.subulatifolia_174         --------------------------------------------------   {991}
E.cyanocolumna_1001         --------------------------------------------------   {986}
E.tenuissima_143            --------------------------------------------------   {958}
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Appendix G—continued.

```
{                                      1260      1270      1280      1290      1300}
{                                         .         .         .         .         .}
Restrepiella_291              ATCTAGAATATTTAGATATATTATTTAGATTATCTAAGAATATTTAGATT   {1111}
Pluer.racemiflora_140         ATAGAGAATATTTA-------------------TCTA-GAATATTTAGATA   {1059}
Ponera.striata_197            TAGATATTAGTAACAGATATTAGTAATCTAATAATAA-------------   {1102}
Isochilis.major_279           TAGATATTAGTAATCTATTAATATAATTATAGAAATAGATAGATTCATTC   {1083}
Epi.ibaguense_60              --------------------------------------------------   {984}
Epi.conopseum_244             --------------------------------------------------   {979}
Nidema.boothii_192            --------------------------------------------------   {984}
S._pulchella_W208             --------------------------------------------------   {976}
H.imbricata_283               --------------------------------------------------   {985}
Reichenbachanthus_W107        --------------------------------------------------   {974}
Hexadesmia_K336               --------------------------------------------------   {986}
Acrorchis_399                 --------------------------------------------------   {982}
Jacquiniella_313              --------------------------------------------------   {986}
Hagsatera_229                 --------------------------------------------------   {989}
Homalopetalum_234             --------------------------------------------------   {998}
Meiracyllium_trinas_129       --------------------------------------------------   {1005}
Psy.mcconnelliae_W53R         --------------------------------------------------   {996}
Psy.krugii_62                 --------------------------------------------------   {997}
Brough.nigrilensis_152        --------------------------------------------------   {988}
Tetramica.elegans_160         --------------------------------------------------   {992}
Domingoa_225                  --------------------------------------------------   {990}
Cattleyopsis_251              --------------------------------------------------   {991}
Brassav.cucullata_130         --------------------------------------------------   {987}
L.rubescens_w284              --------------------------------------------------   {981}
Myrmecophila_281              --------------------------------------------------   {969}
C.dowiana_282                 --------------------------------------------------   {955}
Rhy.glauca_N134               --------------------------------------------------   {987}
C.forbesii_59                 --------------------------------------------------   {930}
Soph.cernua_145               --------------------------------------------------   {986}
L.purpurata_84                --------------------------------------------------   {990}
Schm.splendida_280            --------------------------------------------------   {985}
E.citrina_54                  --------------------------------------------------   {994}
E.mariae_56                   --------------------------------------------------   {971}
E.mariae_87                   --------------------------------------------------   {988}
D.polybulbon_61               --------------------------------------------------   {926}
D.polybulbon_94               --------------------------------------------------   {983}
E.adenocaula_12               --------------------------------------------------   {967}
E.bractescens_21              --------------------------------------------------   {991}
E.aromatica_02                --------------------------------------------------   {995}
E.cordigera_24                --------------------------------------------------   {997}
E.tampensis_27                --------------------------------------------------   {990}
E.tampensis_alba_23           --------------------------------------------------   {994}
E.dichroma_74                 --------------------------------------------------   {969}
E.diurna_09                   --------------------------------------------------   {993}
E.asperula_65                 --------------------------------------------------   {992}
E.candollei_29                --------------------------------------------------   {979}
E.randii_50                   --------------------------------------------------   {997}
E.kienastii_235               --------------------------------------------------   {982}
P.chimborazoensis_51          --------------------------------------------------   {976}
P.fragrans_172                --------------------------------------------------   {984}
P.aemula_17                   --------------------------------------------------   {975}
P.cochleata_31                --------------------------------------------------   {989}
P.pygmaea_81                  --------------------------------------------------   {988}
P.pseudopygmaea_205           --------------------------------------------------   {990}
P.vitellina_57                --------------------------------------------------   {992}
P.glauca_176                  --------------------------------------------------   {991}
P.ionocentra_46               --------------------------------------------------   {994}
P.prismatocarpa_19            --------------------------------------------------   {993}
P.ochracea_95                 --------------------------------------------------   {970}
P.cretacea_230                --------------------------------------------------   {989}
E.luteorosea_178              --------------------------------------------------   {986}
E.luteorosea_173              --------------------------------------------------   {986}
E.subulatifolia_128           --------------------------------------------------   {991}
E.subulatifolia_174           --------------------------------------------------   {991}
E.cyanocolumna_1001           --------------------------------------------------   {986}
E.tenuissima_143              --------------------------------------------------   {958}
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Appendix G—continued.

```
{                                     1310      1320      1330      1340      1350}
{                                        .         .         .         .         .}
Restrepiella_291               CTAGATTAGTATAAGTATATCTATATAGTATAAAGAAATCAATATGATAG  {1161}
Pluer.racemiflora_140          ATATATTAGTCTAAGTATATATAGAAAGTCTAAAGAAATAAGATGAGAGA  {1109}
Ponera.striata_197             --------------------------------------------------  {1102}
Isochilis.major_279            TATATTCTATTTAGATTCTAATAGATTATCTTAAGAATTAGATTAAGAAT  {1133}
Epi.ibaguense_60               --------------------------------------------------  {984}
Epi.conopseum_244              --------------------------------------------------  {979}
Nidema.boothii_192             --------------------------------------------------  {984}
S._pulchella_W208              --------------------------------------------------  {976}
H.imbricata_283                --------------------------------------------------  {985}
Reichenbachanthus_W107         --------------------------------------------------  {974}
Hexadesmia_K336                --------------------------------------------------  {986}
Acrorchis_399                  --------------------------------------------------  {982}
Jacquiniella_313               --------------------------------------------------  {986}
Hagsatera_229                  --------------------------------------------------  {989}
Homalopetalum_234              --------------------------------------------------  {998}
Meiracyllium_trinas_129        --------------------------------------------------  {1005}
Psy.mcconnelliae_W53R          --------------------------------------------------  {996}
Psy.krugii_62                  --------------------------------------------------  {997}
Brough.nigrilensis_152         --------------------------------------------------  {988}
Tetramica.elegans_160          --------------------------------------------------  {992}
Domingoa_225                   --------------------------------------------------  {990}
Cattleyopsis_251               --------------------------------------------------  {991}
Brassav.cucullata_130          --------------------------------------------------  {987}
L.rubescens_w284               --------------------------------------------------  {981}
Myrmecophila_281               --------------------------------------------------  {969}
C.dowiana_282                  --------------------------------------------------  {955}
Rhy.glauca_N134                --------------------------------------------------  {987}
C.forbesii_59                  --------------------------------------------------  {930}
Soph.cernua_145                --------------------------------------------------  {986}
L.purpurata_84                 --------------------------------------------------  {990}
Schm.splendida_280             --------------------------------------------------  {985}
E.citrina_54                   --------------------------------------------------  {994}
E.mariae_56                    --------------------------------------------------  {971}
E.mariae_87                    --------------------------------------------------  {988}
D.polybulbon_61                --------------------------------------------------  {926}
D.polybulbon_94                --------------------------------------------------  {983}
E.adenocaula_12                --------------------------------------------------  {967}
E.bractescens_21               --------------------------------------------------  {991}
E.aromatica_02                 --------------------------------------------------  {995}
E.cordigera_24                 --------------------------------------------------  {997}
E.tampensis_27                 --------------------------------------------------  {990}
E.tampensis_alba_23            --------------------------------------------------  {994}
E.dichroma_74                  --------------------------------------------------  {969}
E.diurna_09                    --------------------------------------------------  {993}
E.asperula_65                  --------------------------------------------------  {992}
E.candollei_29                 --------------------------------------------------  {979}
E.randii_50                    --------------------------------------------------  {997}
E.kienastii_235                --------------------------------------------------  {982}
P.chimborazoensis_51           --------------------------------------------------  {976}
P.fragrans_172                 --------------------------------------------------  {984}
P.aemula_17                    --------------------------------------------------  {975}
P.cochleata_31                 --------------------------------------------------  {989}
P.pygmaea_81                   --------------------------------------------------  {988}
P.pseudopygmaea_205            --------------------------------------------------  {990}
P.vitellina_57                 --------------------------------------------------  {992}
P.glauca_176                   --------------------------------------------------  {991}
P.ionocentra_46                --------------------------------------------------  {994}
P.prismatocarpa_19             --------------------------------------------------  {993}
P.ochracea_95                  --------------------------------------------------  {970}
P.cretacea_230                 --------------------------------------------------  {989}
E.luteorosea_178               --------------------------------------------------  {986}
E.luteorosea_173               --------------------------------------------------  {986}
E.subulatifolia_128            --------------------------------------------------  {991}
E.subulatifolia_174            --------------------------------------------------  {991}
E.cyanocolumna_1001            --------------------------------------------------  {986}
E.tenuissima_143               --------------------------------------------------  {958}
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Appendix G—continued.

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{                                    1360      1370      1380      1390      1400}
{                                       .         .         .         .         .}
Restrepiella_291            TATAAAGAAATAATAT----------------------------------  {1177}
Pluer.racemiflora_140       T-------------------------------------------------  {1110}
Ponera.striata_197          -------------------------------------------------T  {1103}
Isochilis.major_279         CTATCTATTTCTGAATTCTATTATTCTAATTATTATAGATTCTAGATC-T  {1182}
Epi.ibaguense_60            --------------------------------------------------  {984}
Epi.conopseum_244           --------------------------------------------------  {979}
Nidema.boothii_192          --------------------------------------------------  {984}
S._pulchella_W208           --------------------------------------------------  {976}
H.imbricata_283             --------------------------------------------------  {985}
Reichenbachanthus_W107      --------------------------------------------------  {974}
Hexadesmia_K336             --------------------------------------------------  {986}
Acrorchis_399               --------------------------------------------------  {982}
Jacquiniella_313            --------------------------------------------------  {986}
Hagsatera_229               --------------------------------------------------  {989}
Homalopetalum_234           --------------------------------------------------  {998}
Meiracyllium_trinas_129     --------------------------------------------------  {1005}
Psy.mcconnelliae_W53R       --------------------------------------------------  {996}
Psy.krugii_62               --------------------------------------------------  {997}
Brough.nigrilensis_152      --------------------------------------------------  {988}
Tetramica.elegans_160       --------------------------------------------------  {992}
Domingoa_225                --------------------------------------------------  {990}
Cattleyopsis_251            --------------------------------------------------  {991}
Brassav.cucullata_130       --------------------------------------------------  {987}
L.rubescens_w284            --------------------------------------------------  {981}
Myrmecophila_281            --------------------------------------------------  {969}
C.dowiana_282               --------------------------------------------------  {955}
Rhy.glauca_N134             --------------------------------------------------  {987}
C.forbesii_59               --------------------------------------------------  {930}
Soph.cernua_145             --------------------------------------------------  {986}
L.purpurata_84              --------------------------------------------------  {990}
Schm.splendida_280          --------------------------------------------------  {985}
E.citrina_54                --------------------------------------------------  {994}
E.mariae_56                 --------------------------------------------------  {971}
E.mariae_87                 --------------------------------------------------  {988}
D.polybulbon_61             --------------------------------------------------  {926}
D.polybulbon_94             --------------------------------------------------  {983}
E.adenocaula_12             --------------------------------------------------  {967}
E.bractescens_21            --------------------------------------------------  {991}
E.aromatica_02              --------------------------------------------------  {995}
E.cordigera_24              --------------------------------------------------  {997}
E.tampensis_27              --------------------------------------------------  {990}
E.tampensis_alba_23         --------------------------------------------------  {994}
E.dichroma_74               --------------------------------------------------  {969}
E.diurna_09                 --------------------------------------------------  {993}
E.asperula_65               --------------------------------------------------  {992}
E.candollei_29              --------------------------------------------------  {979}
E.randii_50                 --------------------------------------------------  {997}
E.kienastii_235             --------------------------------------------------  {982}
P.chimborazoensis_51        --------------------------------------------------  {976}
P.fragrans_172              --------------------------------------------------  {984}
P.aemula_17                 --------------------------------------------------  {975}
P.cochleata_31              --------------------------------------------------  {989}
P.pygmaea_81                --------------------------------------------------  {988}
P.pseudopygmaea_205         --------------------------------------------------  {990}
P.vitellina_57              --------------------------------------------------  {992}
P.glauca_176                --------------------------------------------------  {991}
P.ionocentra_46             --------------------------------------------------  {994}
P.prismatocarpa_19          --------------------------------------------------  {993}
P.ochracea_95               --------------------------------------------------  {970}
P.cretacea_230              --------------------------------------------------  {989}
E.luteorosea_178            --------------------------------------------------  {986}
E.luteorosea_173            --------------------------------------------------  {986}
E.subulatifolia_128         --------------------------------------------------  {991}
E.subulatifolia_174         --------------------------------------------------  {991}
E.cyanocolumna_1001         --------------------------------------------------  {986}
E.tenuissima_143            --------------------------------------------------  {958}
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Appendix G—continued.

```
{                                                1410      1420      1430      1440      1450}
{                                                   .         .         .         .         .}
Restrepiella_291              --------------------------------------------------   {1177}
Pluer.racemiflora_140         --------------------------------------------------   {1110}
Ponera.striata_197            AGTAGAATTCTATTATGAAATCATAGAAGAATATTTTTATATTCTTTATT   {1153}
Isochilis.major_279           AGTAGAATTCTATTATGAAATCATAGAATAATATTTTTATATTCTTTATT   {1232}
Epi.ibaguense_60              --------------------------------------------------   {984}
Epi.conopseum_244             --------------------------------------------------   {979}
Nidema.boothii_192            --------------------------------------------------   {984}
S._pulchella_W208             --------------------------------------------------   {976}
H.imbricata_283               --------------------------------------------------   {985}
Reichenbachanthus_W107        --------------------------------------------------   {974}
Hexadesmia_K336               --------------------------------------------------   {986}
Acrorchis_399                 --------------------------------------------------   {982}
Jacquiniella_313              --------------------------------------------------   {986}
Hagsatera_229                 --------------------------------------------------   {989}
Homalopetalum_234             --------------------------------------------------   {998}
Meiracyllium_trinas_129       --------------------------------------------------   {1005}
Psy.mcconnelliae_W53R         --------------------------------------------------   {996}
Psy.krugii_62                 --------------------------------------------------   {997}
Brough.nigrilensis_152        --------------------------------------------------   {988}
Tetramica.elegans_160         --------------------------------------------------   {992}
Domingoa_225                  --------------------------------------------------   {990}
Cattleyopsis_251              --------------------------------------------------   {991}
Brassav.cucullata_130         --------------------------------------------------   {987}
L.rubescens_w284              --------------------------------------------------   {981}
Myrmecophila_281              --------------------------------------------------   {969}
C.dowiana_282                 --------------------------------------------------   {955}
Rhy.glauca_N134               --------------------------------------------------   {987}
C.forbesii_59                 --------------------------------------------------   {930}
Soph.cernua_145               --------------------------------------------------   {986}
L.purpurata_84                --------------------------------------------------   {990}
Schm.splendida_280            --------------------------------------------------   {985}
E.citrina_54                  --------------------------------------------------   {994}
E.mariae_56                   --------------------------------------------------   {971}
E.mariae_87                   --------------------------------------------------   {988}
D.polybulbon_61               --------------------------------------------------   {926}
D.polybulbon_94               --------------------------------------------------   {983}
E.adenocaula_12               --------------------------------------------------   {967}
E.bractescens_21              --------------------------------------------------   {991}
E.aromatica_02                --------------------------------------------------   {995}
E.cordigera_24                --------------------------------------------------   {997}
E.tampensis_27                --------------------------------------------------   {990}
E.tampensis_alba_23           --------------------------------------------------   {994}
E.dichroma_74                 --------------------------------------------------   {969}
E.diurna_09                   --------------------------------------------------   {993}
E.asperula_65                 --------------------------------------------------   {992}
E.candollei_29                --------------------------------------------------   {979}
E.randii_50                   --------------------------------------------------   {997}
E.kienastii_235               --------------------------------------------------   {982}
P.chimborazoensis_51          --------------------------------------------------   {976}
P.fragrans_172                --------------------------------------------------   {984}
P.aemula_17                   --------------------------------------------------   {975}
P.cochleata_31                --------------------------------------------------   {989}
P.pygmaea_81                  --------------------------------------------------   {988}
P.pseudopygmaea_205           --------------------------------------------------   {990}
P.vitellina_57                --------------------------------------------------   {992}
P.glauca_176                  --------------------------------------------------   {991}
P.ionocentra_46               --------------------------------------------------   {994}
P.prismatocarpa_19            --------------------------------------------------   {993}
P.ochracea_95                 --------------------------------------------------   {970}
P.cretacea_230                --------------------------------------------------   {989}
E.luteorosea_178              --------------------------------------------------   {986}
E.luteorosea_173              --------------------------------------------------   {986}
E.subulatifolia_128           --------------------------------------------------   {991}
E.subulatifolia_174           --------------------------------------------------   {991}
E.cyanocolumna_1001           --------------------------------------------------   {986}
E.tenuissima_143              --------------------------------------------------   {958}
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Appendix G—continued.

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{                                      1460      1470      1480      1490      1500}
{                                         .         .         .         .         .}
Restrepiella_291              -------------------------------------------------G   {1178}
Pluer.racemiflora_140         -------------------------------------------------G   {1111}
Ponera.striata_197            CCTTTCAGATTTCTACATATTTCT--------------------------   {1177}
Isochilis.major_279           CCTTTCAGATTTCTACATATTTCTATTACTATTCATAGAGTAATAGTATG   {1282}
Epi.ibaguense_60              -------------------------------------------------G   {985}
Epi.conopseum_244             -------------------------------------------------G   {980}
Nidema.boothii_192            -------------------------------------------------G   {985}
S._pulchella_W208             -------------------------------------------------G   {977}
H.imbricata_283               -------------------------------------------------G   {986}
Reichenbachanthus_W107        -------------------------------------------------G   {975}
Hexadesmia_K336               -------------------------------------------------G   {987}
Acrorchis_399                 -------------------------------------------------G   {983}
Jacquiniella_313              -------------------------------------------------G   {987}
Hagsatera_229                 -------------------------------------------------G   {990}
Homalopetalum_234             --------------------------------------------------   {998}
Meiracyllium_trinas_129       -------------------------------------------------G   {1006}
Psy.mcconnelliae_W53R         -------------------------------------------------G   {997}
Psy.krugii_62                 -------------------------------------------------G   {998}
Brough.nigrilensis_152        -------------------------------------------------G   {989}
Tetramica.elegans_160         -------------------------------------------------G   {993}
Domingoa_225                  -------------------------------------------------G   {991}
Cattleyopsis_251              -------------------------------------------------G   {992}
Brassav.cucullata_130         -------------------------------------------------G   {988}
L.rubescens_w284              -------------------------------------------------G   {982}
Myrmecophila_281              -------------------------------------------------G   {970}
C.dowiana_282                 -------------------------------------------------G   {956}
Rhy.glauca_N134               -------------------------------------------------G   {988}
C.forbesii_59                 -------------------------------------------------G   {931}
Soph.cernua_145               -------------------------------------------------G   {987}
L.purpurata_84                ----------------------------------------GAGATAAATG   {1000}
Schm.splendida_280            -------------------------------------------------G   {986}
E.citrina_54                  -------------------------------------------------G   {995}
E.mariae_56                   -------------------------------------------------G   {972}
E.mariae_87                   -------------------------------------------------G   {989}
D.polybulbon_61               -------------------------------------------------G   {927}
D.polybulbon_94               -------------------------------------------------G   {984}
E.adenocaula_12               -------------------------------------------------G   {968}
E.bractescens_21              -------------------------------------------------G   {992}
E.aromatica_02                -------------------------------------------------G   {996}
E.cordigera_24                -------------------------------------------------G   {998}
E.tampensis_27                -------------------------------------------------G   {991}
E.tampensis_alba_23           -------------------------------------------------G   {995}
E.dichroma_74                 -------------------------------------------------G   {970}
E.diurna_09                   -------------------------------------------------G   {994}
E.asperula_65                 -------------------------------------------------G   {993}
E.candollei_29                -------------------------------------------------G   {980}
E.randii_50                   -------------------------------------------------G   {998}
E.kienastii_235               -------------------------------------------------G   {983}
P.chimborazoensis_51          -------------------------------------------------G   {977}
P.fragrans_172                -------------------------------------------------G   {985}
P.aemula_17                   -------------------------------------------------G   {976}
P.cochleata_31                -------------------------------------------------G   {990}
P.pygmaea_81                  -------------------------------------------------G   {989}
P.pseudopygmaea_205           -------------------------------------------------G   {991}
P.vitellina_57                -------------------------------------------------G   {993}
P.glauca_176                  -------------------------------------------------G   {992}
P.ionocentra_46               -------------------------------------------------G   {995}
P.prismatocarpa_19            -------------------------------------------------G   {994}
P.ochracea_95                 -------------------------------------------------G   {971}
P.cretacea_230                -------------------------------------------------G   {990}
E.luteorosea_178              -------------------------------------------------G   {987}
E.luteorosea_173              -------------------------------------------------G   {987}
E.subulatifolia_128           -------------------------------------------------G   {992}
E.subulatifolia_174           -------------------------------------------------G   {992}
E.cyanocolumna_1001           -------------------------------------------------G   {987}
E.tenuissima_143              --------------------------------------------------   {958}
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Appendix G—continued.

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[                                  1510      1520      1530      1540      1550]
[                                     .         .         .         .         .]
Restrepiella_291              AGATAAGGATCTATATAAACCCTCTATTTCTAT-TCTCT-----------    [1216]
Pluer.racemiflora_140         AGATAAGGATCTATAGAAAACCTCTAGTTCTATATTTCT--------ATT    [1153]
Ponera.striata_197            -----------------------------------------------ATT    [1180]
Isochilis.major_279           AGATAAGGATCTATAGAAACCCTCTATTTCTAT-TCTCT-----------    [1320]
Epi.ibaguense_60              AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1027]
Epi.conopseum_244             AGATAAGGATCTATAGAAACCTTCTATTTCTACATTTCT--------ATT    [1022]
Nidema.boothii_192            AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1027]
S._pulchella_W208             AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1019]
H.imbricata_283               AGATAAGGATCTATAGATACCCTCTATTTCTACATTTCT--------ATT    [1028]
Reichenbachanthus_W107        AGATAAGGATCTATAGATACCCTCTATTTCTACATTTCT--------ATT    [1017]
Hexadesmia_K336               AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1029]
Acrorchis_399                 AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1025]
Jacquiniella_313              AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1029]
Hagsatera_229                 AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1032]
Homalopetalum_234             -------------GGAAACCCTCTATTTCTACATTTCT--------ATT    [1026]
Meiracyllium_trinas_129       AGATAAGGATCTATAGAAACTCTCTATTTCTACATTTCT--------ATT    [1048]
Psy.mcconnelliae_W53R         AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1039]
Psy.krugii_62                 AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1040]
Brough.nigrilensis_152        AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1031]
Tetramica.elegans_160         AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1035]
Domingoa_225                  AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1033]
Cattleyopsis_251              AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1034]
Brassav.cucullata_130         AGATAAAGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1030]
L.rubescens_w284              AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1024]
Myrmecophila_281              AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1012]
C.dowiana_282                 AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCTACATTTCTATT    [1006]
Rhy.glauca_N134               AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1030]
C.forbesii_59                 AGATAAGGATTTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [973]
Soph.cernua_145               AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1029]
L.purpurata_84                AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1042]
Schm.splendida_280            AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1028]
E.citrina_54                  AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1037]
E.mariae_56                   AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1014]
E.mariae_87                   AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1031]
D.polybulbon_61               AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [969]
D.polybulbon_94               AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1026]
E.adenocaula_12               AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1010]
E.bractescens_21              AGATAAGGATCTATAGAAACCCTCTATTTTCACATTTCT--------ATT    [1034]
E.aromatica_02                AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1038]
E.cordigera_24                AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1040]
E.tampensis_27                AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1033]
E.tampensis_alba_23           AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1037]
E.dichroma_74                 AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1012]
E.diurna_09                   AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1036]
E.asperula_65                 AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1035]
E.candollei_29                AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1022]
E.randii_50                   AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1040]
E.kienastii_235               AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1025]
P.chimborazoensis_51          AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1019]
P.fragrans_172                AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1027]
P.aemula_17                   AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1018]
P.cochleata_31                AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1032]
P.pygmaea_81                  AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1031]
P.pseudopygmaea_205           AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1033]
P.vitellina_57                AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1035]
P.glauca_176                  AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1034]
P.ionocentra_46               AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1037]
P.prismatocarpa_19            AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1036]
P.ochracea_95                 AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1013]
P.cretacea_230                AGATAAGGATCTATAGGAATACTCTATTTCTACATTTCT--------ATT    [1032]
E.luteorosea_178              AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1029]
E.luteorosea_173              AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1029]
E.subulatifolia_128           AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1034]
E.subulatifolia_174           AGATAAGGATCTATAGAAACCCTCTATTTCTACATTTCT--------ATT    [1034]
E.cyanocolumna_1001           AGATAAGGATCTATAGAAATCCTCTATTTCTACATTTCT--------ATT    [1029]
E.tenuissima_143              --------------------------------------------------    [958]
```

Appendix G—continued.

{	1560 1570 1580 1590 1600}	
{	. . . . .}	
Restrepiella_291	----ATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATTGAA-	{1260}
Pluer.racemiflora_140	CTCTATGAATTAGAATGATAGAGATAAA-AAAATATATGAAAAATTGAA-	{1201}
Ponera.striata_197	CTCTATGAATTAGAATGATAGAGATCAA-AAAAGATATGAAAAATTGAA-	{1228}
Isochilis.major_279	----ATGAATTAGAATGATAGAGATCAA-AAAAGATATGAAAAATTGAAA	{1365}
Epi.ibaguense_60	CTCTATGAATTAGAATGATAGAGATAAA-AAAATAGAGGAAAAATGGAA-	{1075}
Epi.conopseum_244	CTCTATGAATTAGAATTATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1070}
Nidema.boothii_192	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1075}
S._pulchella_W208	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1067}
H.imbricata_283	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1076}
Reichenbachanthus_W107	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1065}
Hexadesmia_K336	CTCTATGAATTAGAATAATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1077}
Acrorchis_399	CTATATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1073}
Jacquiniella_313	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1077}
Hagsatera_229	CTCTATGAATTAGAATGATAGAGATCAA-AAGATATATGAAAAATGGAA-	{1080}
Homalopetalum_234	CTCTATGAATTAGAATGAGAGAGATCAA-AAAATATATGAAAAATGGAA-	{1074}
Meiracyllium_trinas_129	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1096}
Psy.mcconnelliae_W53R	CTCTATGAATTAGAATGATAGAGATCAAAAGAATATATGAAAAATGGAA-	{1088}
Psy.krugii_62	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1088}
Brough.nigrilensis_152	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1079}
Tetramica.elegans_160	CTCTATGAATTAGAATGATAGAGATCAA-AAAAGATATGAAAAATGGAA-	{1083}
Domingoa_225	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1081}
Cattleyopsis_251	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1082}
Brassav.cucullata_130	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1078}
L.rubescens_w284	CTCTATGATTTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1072}
Myrmecophila_281	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1060}
C.dowiana_282	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1054}
Rhy.glauca_N134	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1078}
C.forbesii_59	CTCTATGAATTAGAATGATAGAGATCAA-AAGATCTATTAAAAATGAAA-	{1021}
Soph.cernua_145	CTCTATGAATTAGAATGATAGAGATCAA-AAAATAGATGAAAAATGGAA-	{1077}
L.purpurata_84	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1090}
Schm.splendida_280	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1076}
E.citrina_54	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1085}
E.mariae_56	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1062}
E.mariae_87	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1079}
D.polybulbon_61	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1017}
D.polybulbon_94	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1074}
E.adenocaula_12	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1058}
E.bractescens_21	CTCTATGAATTAGAATGATAGAGATCAATAGAATATCTGAAAAATGGA-G	{1083}
E.aromatica_02	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1086}
E.cordigera_24	CTCTATGAATTAGAATGATATAGATCAA-AAAATATATGAAAAATGGAA-	{1088}
E.tampensis_27	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1081}
E.tampensis_alba_23	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1085}
E.dichroma_74	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1060}
E.diurna_09	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1084}
E.asperula_65	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1083}
E.candollei_29	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1070}
E.randii_50	CTCTATGAATTAGAATGATAGAGATCGA-AAAATATATGAAAAATGGAA-	{1088}
E.kienastii_235	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1073}
P.chimborazoensis_51	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1067}
P.fragrans_172	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1075}
P.aemula_17	CTCTATGAATTAGAATGATAGAGATCAA-AAAATAGATGAAAAATGGAA-	{1066}
P.cochleata_31	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1080}
P.pygmaea_81	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1079}
P.pseudopygmaea_205	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1081}
P.vitellina_57	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1083}
P.glauca_176	CTCTATAAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1082}
P.ionocentra_46	CTCTATAAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1085}
P.prismatocarpa_19	CTCTATAAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1084}
P.ochracea_95	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1061}
P.cretacea_230	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1080}
E.luteorosea_178	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1077}
E.luteorosea_173	CTCTATGAATTAGAATGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1077}
E.subulatifolia_128	CTCTATGAATTAGAAGGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1082}
E.subulatifolia_174	CTCTATGAATTAGAAGGATAGAGATCAA-AAAATATATGAAAAATGGAA-	{1082}
E.cyanocolumna_1001	CTCTATGAATTAGAATGATAGAGATCAA-AAGATATATGAAAAATGGAA-	{1077}
E.tenuissima_143	--	{958}

Appendix G—continued.

{	1610 1620 1630 1640 1650 }	
{	. . . . . }	
Restrepiella_291	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1294}
Pluer.racemiflora_140	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1235}
Ponera.striata_197	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1262}
Isochilis.major_279	GAGTTATT-------GTGAATCAATT-TCAATT-GAAGTT-------GAA	{1399}
Epi.ibaguense_60	GAGTTATT-------GTGAATCAATAATCAATT-CCAATT-------GAA	{1110}
Epi.conopseum_244	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1104}
Nidema.boothii_192	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1109}
S._pulchella_W208	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1101}
H.imbricata_283	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1110}
Reichenbachanthus_W107	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1099}
Hexadesmia_K336	GAGTTATT-------GTGAATCAATT-TCAATT-GAAGTT-------GAA	{1111}
Acrorchis_399	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1107}
Jacquiniella_313	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1111}
Hagsatera_229	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1114}
Homalopetalum_234	-AGTTATT-------ATGAATAAATT-TCAATT-GAAGTT-------GAA	{1107}
Meiracyllium_trinas_129	GAGTTATT-------GTGAATCAATT-CCAATTTAAAGT-----------	{1127}
Psy.mcconnelliae_W53R	GAGTTATT-------GTGAATCAAGT-CCAATT-GAAGTT-------GAA	{1122}
Psy.krugii_62	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1122}
Brough.nigrilensis_152	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1113}
Tetramica.elegans_160	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1117}
Domingoa_225	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1115}
Cattleyopsis_251	GAGTTATTAGTTATTGTGAATCAATT-CCAATT-GAAGTT-------GAA	{1123}
Brassav.cucullata_130	GAGTTATT-------GTGAATCAATT-CCAATTT-AAGTT-------GAA	{1112}
L.rubescens_w284	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1106}
Myrmecophila_281	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1094}
C.dowiana_282	GAGTTCTT-------GTGAATCAATT-CCAATTT-AAGTT-------GAA	{1088}
Rhy.glauca_N134	GAGTTATT-------GTGAATCAATT-CCAATT-TAAGTT-------GAA	{1112}
C.forbesii_59	GAGTTATT-------GTGAATCAATT-CCAATTT-AAGTT-------GAA	{1055}
Soph.cernua_145	GAGTTATT-------GTGAATCAATT-CCAATTT-AAGTT-------GAA	{1111}
L.purpurata_84	GAGTTATT-------GTGAATGAATT-CCAATTT-AAGTT-------GAA	{1124}
Schm.splendida_280	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1110}
E.citrina_54	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1119}
E.mariae_56	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1096}
E.mariae_87	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1113}
D.polybulbon_61	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1051}
D.polybulbon_94	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1108}
E.adenocaula_12	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1092}
E.bractescens_21	GAGTTATG-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1117}
E.aromatica_02	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1120}
E.cordigera_24	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1122}
E.tampensis_27	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1115}
E.tampensis_alba_23	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1119}
E.dichroma_74	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1094}
E.diurna_09	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1118}
E.asperula_65	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1117}
E.candollei_29	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1104}
E.randii_50	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1122}
E.kienastii_235	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1107}
P.chimborazoensis_51	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1101}
P.fragrans_172	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1109}
P.aemula_17	GAGTTCTT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1100}
P.cochleata_31	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1114}
P.pygmaea_81	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1113}
P.pseudopygmaea_205	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1115}
P.vitellina_57	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1117}
P.glauca_176	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1116}
P.ionocentra_46	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1119}
P.prismatocarpa_19	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1118}
P.ochracea_95	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1095}
P.cretacea_230	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1114}
E.luteorosea_178	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1111}
E.luteorosea_173	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1111}
E.subulatifolia_128	GAGTTATT-------GTGAATCAATT-ACAATT-GAAGTT-------GAA	{1116}
E.subulatifolia_174	GAGTTATT-------GTGAATCAATT-ACAATT-GAAGTT-------GAA	{1116}
E.cyanocolumna_1001	GAGTTATT-------GTGAATCAATT-CCAATT-GAAGTT-------GAA	{1111}
E.tenuissima_143	--	{958}

Appendix G—continued.

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{                                  1660      1670      1680      1690      1700}
{                                     .         .         .         .         .}
Restrepiella_291            AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1334}
Pluer.racemiflora_140       AAAAGGATCGAATTCGAATATT----------AAGTGATCAAATGATTCA   {1275}
Ponera.striata_197          AAAAGAATTGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1302}
Isochilis.major_279         AAAAGAATTGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1439}
Epi.ibaguense_60            GTTGAAAAAAGTATCGAAT----TCGAATATTCAGTGATCAAATTATTCA   {1156}
Epi.conopseum_244           AAAAGAATTGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1144}
Nidema.boothii_192          AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1149}
S._pulchella_W208           AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1141}
H.imbricata_283             AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1150}
Reichenbachanthus_W107      AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1139}
Hexadesmia_K336             AAAAGAATCAAATTCAAATATT----------CAGTGATCAAATGATTCA   {1151}
Acrorchis_399               AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1147}
Jacquiniella_313            AAAAGAATCGAATTCGAATATT----------AAGTGATCAAATGATTCA   {1151}
Hagsatera_229               AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1154}
Homalopetalum_234           AAAAGAATCGAATTCCAATATT----------CAGTGATCAAATGATTCA   {1147}
Meiracyllium_trinas_129     ------------------------------------GATCAAATGATTCA   {1141}
Psy.mcconnelliae_W53R       AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1162}
Psy.krugii_62               AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1162}
Brough.nigrilensis_152      AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1153}
Tetramica.elegans_160       AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1157}
Domingoa_225                AAAAGAATCGAATTCGAATATT----------AAGTGATCAAATGATTCA   {1155}
Cattleyopsis_251            AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1163}
Brassav.cucullata_130       AAAAGAATAGAATTCGAATATT----------CAATGATCAAATGATTCA   {1152}
L.rubescens_w284            AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1146}
Myrmecophila_281            AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1134}
C.dowiana_282               AAAAGAATAGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1128}
Rhy.glauca_N134             AAAAGAATAGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1152}
C.forbesii_59               AAAAGAATAGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1095}
Soph.cernua_145             AAAAGAATAGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1151}
L.purpurata_84              AAAAGAATAGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1164}
Schm.splendida_280          AAAAGAATTGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1150}
E.citrina_54                AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1159}
E.mariae_56                 AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1136}
E.mariae_87                 AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1153}
D.polybulbon_61             AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1091}
D.polybulbon_94             AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1148}
E.adenocaula_12             AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1132}
E.bractescens_21            AAAAGAATCGAATTCGAATATTCTCGAATATTCAGTGATCAAATGATTCA   {1167}
E.aromatica_02              AAAAGAATCGAATTCGAATCTTCTCGAATATTCAGTGATCAAATGATTCA   {1170}
E.cordigera_24              AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1162}
E.tampensis_27              AAAAGAATCGAATTCGAATATTCTCGAATATTCAGTGATCAAATGATTCA   {1165}
E.tampensis_alba_23         AAAAGAATCGAATTCGAATATTCTCGAATATTCAGTGATCAAATGATTCA   {1169}
E.dichroma_74               AAAAGAATCGAATTCGAATATTCTCGAATATTCAGTGATCAAATGATTCA   {1144}
E.diurna_09                 AAAAGAATCGAATTCGAATATTCTCGAATATTCAGTGATCAAATGATTCA   {1168}
E.asperula_65               AAAAGAATCGAATTCGAATATTCTCGAATATTCAGTGATCAAATGATTCA   {1167}
E.candollei_29              AAAAGAATCGAATTCGAATATTCTCGAATATTCAGTGATCAAATGATTCA   {1154}
E.randii_50                 AAAAGAATCGAATTCGAATATTCTCGAATATTCAGTGATCAAATGATTCA   {1172}
E.kienastii_235             AAAAGAATCGAATTCGAATATTC----------AGTGATCAAATGATTCA   {1147}
P.chimborazoensis_51        AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1141}
P.fragrans_172              AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1149}
P.aemula_17                 AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1140}
P.cochleata_31              AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1154}
P.pygmaea_81                AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1153}
P.pseudopygmaea_205         AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1155}
P.vitellina_57              AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1157}
P.glauca_176                AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1156}
P.ionocentra_46             AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1159}
P.prismatocarpa_19          AAAAGAATCGAATTCAAATATT----------CAGTGATCAAATGATTCA   {1158}
P.ochracea_95               AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1135}
P.cretacea_230              AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1154}
E.luteorosea_178            AAAAGAATCAAATTCAAATATT----------CAGTAATCAAATGATTCA   {1151}
E.luteorosea_173            AAAAGAATCAAATTCAAATATT----------CAGTAATCAAATGATTCA   {1151}
E.subulatifolia_128         AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1156}
E.subulatifolia_174         AAAAGAATCGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1156}
E.cyanocolumna_1001         AAAAGAATTGAATTCGAATATT----------CAGTGATCAAATGATTCA   {1151}
E.tenuissima_143            ------------------------------------------ATGATTCA   {966}
```

Appendix G—continued.

{	1710 1720 1730 1740 1750}	
Restrepiella_291	TTCCAGAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1373}
Pluer.racemiflora_140	TTCCAGAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1314}
Ponera.striata_197	TTCCAGAGTTTGATAGATCTTTTGAAGATTAAT----------AGG-ACG	{1341}
Isochilis.major_279	TTCCAGAGTTTGATAGATCTTTTGAAGATTAAT----------AGG-ACG	{1478}
Epi.ibaguense_60	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1195}
Epi.conopseum_244	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1183}
Nidema.boothii_192	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1188}
S._pulchella_W208	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1180}
H.imbricata_283	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1189}
Reichenbachanthus_W107	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1178}
Hexadesmia_K336	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1190}
Acrorchis_399	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1186}
Jacquiniella_313	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1190}
Hagsatera_229	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1193}
Homalopetalum_234	TTCCAAAATTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1186}
Meiracyllium_trinas_129	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1180}
Psy.mcconnelliae_W53R	TTCCAAAG--------ATCTTTTGAAGATTAAT----------CGG-ACG	{1193}
Psy.krugii_62	TTCCAAAG--------ATCTTTTGAAGATTAAT----------CGG-ACG	{1193}
Brough.nigrilensis_152	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1192}
Tetramica.elegans_160	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1196}
Domingoa_225	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1194}
Cattleyopsis_251	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1202}
Brassav.cucullata_130	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1191}
L.rubescens_w284	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1185}
Myrmecophila_281	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1173}
C.dowiana_282	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1167}
Rhy.glauca_N134	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1191}
C.forbesii_59	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1134}
Soph.cernua_145	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------TGG-ACG	{1190}
L.purpurata_84	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1203}
Schm.splendida_280	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1189}
E.citrina_54	TTCCAAACTTTGATAGATCTTTTGAAGATTAAT----------TGG-ACG	{1198}
E.mariae_56	TTCCAAACTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1175}
E.mariae_87	TTCCAAACTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1192}
D.polybulbon_61	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1130}
D.polybulbon_94	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1187}
E.adenocaula_12	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1171}
E.bractescens_21	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1206}
E.aromatica_02	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1209}
E.cordigera_24	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1201}
E.tampensis_27	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1204}
E.tampensis_alba_23	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1208}
E.dichroma_74	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1183}
E.diurna_09	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1207}
E.asperula_65	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1206}
E.candollei_29	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1193}
E.randii_50	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1211}
E.kienastii_235	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1186}
P.chimborazoensis_51	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1180}
P.fragrans_172	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1188}
P.aemula_17	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1179}
P.cochleata_31	TTCCAAAGTTTGATAGATCTTTTGAAGATTAATGAAGATTAATCGG-ACG	{1203}
P.pygmaea_81	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1192}
P.pseudopygmaea_205	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1194}
P.vitellina_57	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1196}
P.glauca_176	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1195}
P.ionocentra_46	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1198}
P.prismatocarpa_19	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1197}
P.ochracea_95	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGGGACG	{1175}
P.cretacea_230	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------TGG-ACG	{1193}
E.luteorosea_178	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1190}
E.luteorosea_173	TTCCAAAGTTTGATAGATCTTTTGAAGATTAAT----------CGG-ACG	{1190}
E.subulatifolia_128	TTCCAAAGTTTGATAGATCTTTTGAAGATGAAT----------CGG-ACG	{1195}
E.subulatifolia_174	TTCCAAAGTTTGATAGATCTTTTGAAGATGAAT----------CGG-ACG	{1195}
E.cyanocolumna_1001	TTCCAAAGTTTGATATATCTTTTGAAGATTAAT----------CGG-ACG	{1190}
E.tenuissima_143	TTCCAAAGTTTGATATATCTTTTGAAGATTAAT----------CGG-ACG	{1005}

Appendix G—continued.

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{                                                  1760      1770      1780      1790      1800}
{                                                     .         .         .         .         .}
Restrepiella_291              AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1423}
Pluer.racemiflora_140         AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1364}
Ponera.striata_197            AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1391}
Isochilis.major_279           AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1528}
Epi.ibaguense_60              AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1245}
Epi.conopseum_244             AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1233}
Nidema.boothii_192            AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1238}
S._pulchella_W208             AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1230}
H.imbricata_283               AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1239}
Reichenbachanthus_W107        AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1228}
Hexadesmia_K336               AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1240}
Acrorchis_399                 AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1236}
Jacquiniella_313              AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1240}
Hagsatera_229                 AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1243}
Homalopetalum_234             AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1236}
Meiracyllium_trinas_129       AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1230}
Psy.mcconnelliae_W53R         AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1243}
Psy.krugii_62                 AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1243}
Brough.nigrilensis_152        AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1242}
Tetramica.elegans_160         AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1246}
Domingoa_225                  AGAATAAAGAGAGAGTCCTATTTTACATGTCAATACCGACAACAATGAAA   {1244}
Cattleyopsis_251              AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1252}
Brassav.cucullata_130         AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1241}
L.rubescens_w284              AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1235}
Myrmecophila_281              AGAATAAAGAGTGTGTCCCTTTTTACATGTCAATACCGACAACAATGAAA   {1223}
C.dowiana_282                 AGAATAAAGAGAGAGTCCCTTTTTACATGTCAATACCGACAACAATGAAA   {1217}
Rhy.glauca_N134               AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1241}
C.forbesii_59                 AGAATAAAGAGAGAGTCCCTTTTTACATGTCAATACCGACAACMATGRAA   {1184}
Soph.cernua_145               AGAATAAAGAGAGAGTCCCTTTTTACATGTCAATACCGACAACAATGAAA   {1240}
L.purpurata_84                AGAATAAAGAGAGAGTCCCTTTTTACATGTCAATACCGACAACAATGAAA   {1253}
Schm.splendida_280            AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1239}
E.citrina_54                  AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1248}
E.mariae_56                   AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1225}
E.mariae_87                   AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1242}
D.polybulbon_61               AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAA-   {1179}
D.polybulbon_94               AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1237}
E.adenocaula_12               AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1221}
E.bractescens_21              AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1256}
E.aromatica_02                AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1259}
E.cordigera_24                AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGGCAACAATGAA-   {1250}
E.tampensis_27                AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1254}
E.tampensis_alba_23           AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1258}
E.dichroma_74                 AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1233}
E.diurna_09                   AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1257}
E.asperula_65                 AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1256}
E.candollei_29                AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1243}
E.randii_50                   AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1261}
E.kienastii_235               AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1236}
P.chimborazoensis_51          AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1230}
P.fragrans_172                AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1238}
P.aemula_17                   AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1229}
P.cochleata_31                AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1253}
P.pygmaea_81                  AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1242}
P.pseudopygmaea_205           AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1244}
P.vitellina_57                AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1246}
P.glauca_176                  AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1245}
P.ionocentra_46               AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1248}
P.prismatocarpa_19            AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1247}
P.ochracea_95                 AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1225}
P.cretacea_230                AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1243}
E.luteorosea_178              AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1240}
E.luteorosea_173              AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1240}
E.subulatifolia_128           AGAATAAAGAGAGAGTCCCATTTTACATGTCAATGCCGACAACAATGAAA   {1245}
E.subulatifolia_174           AGAATAAAGAGAGAGTCCCATTTTACATGTCAATGCCGACAACAATGAAA   {1245}
E.cyanocolumna_1001           AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1240}
E.tenuissima_143              AGAATAAAGAGAGAGTCCCATTTTACATGTCAATACCGACAACAATGAAA   {1055}
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Appendix G—continued.

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{                                         1810      1820      1830      1840      1850}
{                                            .         .         .         .         .}
Restrepiella_291              TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1466}
Pluer.racemiflora_140         TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTT-GAAAT-CGT--GAGG    {1407}
Ponera.striata_197            TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1434}
Isochilis.major_279           TTTATAGTA-AGAGGAAAA-TCCCGTCGAATTTT-GAAAT-CGT--GAGG    {1572}
Epi.ibaguense_60              TTTATAGTA-ATAGGAAAA-TCCGTC-GAATTT--TAAAT-CGT--GAGG    {1287}
Epi.conopseum_244             TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TGAAAT-CGT--GAGG    {1276}
Nidema.boothii_192            TTTATAGTA-ATAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1281}
S._pulchella_W208             TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTTG-AAAT-CGT--GAGG    {1273}
H.imbricata_283               TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTTT-AAAT-CGT--GAGG    {1282}
Reichenbachanthus_W107        TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTT-TAAAT-CGT--GAGG    {1271}
Hexadesmia_K336               TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTTT-AAAT-CGT--GAGG    {1283}
Acrorchis_399                 TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT--TAAAT-CGT--GAGG    {1278}
Jacquiniella_313              TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTTT-AAAT-CGT--GAGG    {1283}
Hagsatera_229                 TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1286}
Homalopetalum_234             TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1279}
Meiracyllium_trinas_129       TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAATACGT--GAGG    {1274}
Psy.mcconnelliae_W53R         TTTATAGTA-AAAGGAAAA-TCCGTC-GAATTT--TAAAT-CGT--GAGG    {1285}
Psy.krugii_62                 TTTATAGTA-AAAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1286}
Brough.nigrilensis_152        TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1285}
Tetramica.elegans_160         TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1289}
Domingoa_225                  TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1287}
Cattleyopsis_251              TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT--TAAAT-CGT--GAGG    {1294}
Brassav.cucullata_130         TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTT--AAAT-CGT--GAGG    {1283}
L.rubescens_w284              TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTTT-AAAT-CGT--GAGG    {1278}
Myrmecophila_281              TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTTT-AACT-CGT--GAGG    {1266}
C.dowiana_282                 TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTTT-AAAT-CGT--GAGG    {1260}
Rhy.glauca_N134               TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1284}
C.forbesii_59                 TTTATAGTA-AGAGGRAAA-TCCGTC-GAATTTTT-AAAT-CGT--GAGG    {1227}
Soph.cernua_145               TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTT-GAAAT-CGT--GAGG    {1283}
L.purpurata_84                TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTT--AAAT-CGT--GAGG    {1295}
Schm.splendida_280            TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTT--AAAT-CGT--GAGG    {1281}
E.citrina_54                  TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1291}
E.mariae_56                   TTTATAGTATAGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1269}
E.mariae_87                   TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1285}
D.polybulbon_61               TTTATAGTA-ATAGGAAA--TCCGTC-GAATTT--TAAAT-CGT--GAGG    {1220}
D.polybulbon_94               TTTATAGTA-ATAGGAAAA-TCCGTC-GAATTT--TAAAT-CGT--GAGG    {1279}
E.adenocaula_12               TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1264}
E.bractescens_21              TTTATAGTA-AGAGGAAA--TCCGTC-GAATTT-T-AAAT-CGT-TGAGG    {1298}
E.aromatica_02                TTTATAGTA-AGAGGAAAG-TCCGTC-GA-TTT-T-AAAT-CGT-GGAGG    {1301}
E.cordigera_24                TTTATAGTA-AGAGGAAA--TCCGTC-GAATTT-TGAAAT-CGT--GAGG    {1292}
E.tampensis_27                TTTATAGTA-AGAGGAAA--TCCGTC-GAATTT-T-AAAT-CGT-TGAGG    {1296}
E.tampensis_alba_23           TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-T-AAAT-CGT--GAGG    {1300}
E.dichroma_74                 TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1276}
E.diurna_09                   TTTATAGTA-AGAGGAAA--TCCGTC-GAATTT--TAAAT-CGT-TGAGG    {1299}
E.asperula_65                 TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT--TAAAT-CGT--GAGG    {1298}
E.candollei_29                TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-T-AAAT-CGT--GAGG    {1285}
E.randii_50                   TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-T--AAT-CGT--GAGG    {1302}
E.kienastii_235               TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1279}
P.chimborazoensis_51          TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1273}
P.fragrans_172                TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1281}
P.aemula_17                   TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1272}
P.cochleata_31                TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1296}
P.pygmaea_81                  TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-ATAAAT-CGT--GAGG    {1285}
P.pseudopygmaea_205           TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1287}
P.vitellina_57                TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1289}
P.glauca_176                  TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TGAAAT-CGT--GAGG    {1288}
P.icnocentra_46               TTTATAGTA-AGAGGAAAA-TCCGTCCGAATTT-TGAAAT-CGTATGAGG    {1294}
P.prismatocarpa_19            TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TGAAAT-CGT--GAGG    {1290}
P.ochracea_95                 TTTATAGTA-AAAGGAAAA-TCCGTC-GAATTTCTTAAAT-CGT--GAGG    {1269}
P.cretacea_230                TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TGAAAT-CGT--GAGG    {1286}
E.luteorosea_178              TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTT--AAAT-CGT--GAGG    {1282}
E.luteorosea_173              TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTT--AAAT-CGT--GAGG    {1282}
E.subulatifolia_128           TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-T-AAAT-CGT--GAGG    {1287}
E.subulatifolia_174           TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTTT-TAAAT-CGT--GAGG    {1288}
E.cyanocolumna_1001           TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1283}
E.tenuissima_143              TTTATAGTA-AGAGGAAAA-TCCGTC-GAATTT-TTAAAT-CGT--GAGG    {1098}
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Appendix G—continued.

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{                                      1860      1870      1880      1890      1900}
{                                         .         .         .         .         .}
Restrepiella_291              GTTCAAGTCCCTCTATCCCCACT------------AAAAAGCCCATT-TT   {1503}
Pluer.racemiflora_140         GGTCAAGTCCCTCTATCCCCACT------------AAAAAGCCCATT-TT   {1444}
Ponera.striata_197            GTTCAAGTCCCTCTATCCCCAAT-----------AAAAATCCCCAT--AA   {1471}
Isochilis.major_279           GTTCAAGTCCCTCTATCCCCAAG------------AAAAAGCCCATTTTA   {1610}
Epi.ibaguense_60              GTTCAAGTCCCTCTATCCCC-AT---CCCCGAGAAAAGAAGCCCAGT--T   {1331}
Epi.conopseum_244             GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1313}
Nidema.boothii_192            GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1318}
S._pulchella_W208             GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT--T   {1309}
H.imbricata_283               GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1319}
Reichenbachanthus_W107        GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1308}
Hexadesmia_K336               GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1320}
Acrorchis_399                 GT-CAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1314}
Jacquiniella_313              GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1320}
Hagsatera_229                 GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1323}
Homalopetalum_234             GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1316}
Meiracyllium_trinas_129       GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1311}
Psy.mcconnelliae_W53R         GTTCAAGTCCCTCTATCCCCAAG------------AAAAAGCCCATT--T   {1321}
Psy.krugii_62                 GTTCAAGTCCCTCTATCCCCAAG------------AAAAAGCCCATC-TT   {1323}
Brough.nigrilensis_152        GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1322}
Tetramica.elegans_160         GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT--T   {1325}
Domingoa_225                  GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1324}
Cattleyopsis_251              GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1331}
Brassav.cucullata_130         GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1320}
L.rubescens_w284              GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1315}
Myrmecophila_281              GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1303}
C.dowiana_282                 GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1297}
Rhy.glauca_N134               GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1321}
C.forbesii_59                 GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1264}
Soph.cernua_145               GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1320}
L.purpurata_84                GT-CAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT--T   {1330}
Schm.splendida_280            GT-CAAGTCCCTCTATCCCCAAT------------AAAAAGCC-ATC-TT   {1316}
E.citrina_54                  GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1328}
E.mariae_56                   GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1306}
E.mariae_87                   GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1322}
D.polybulbon_61               GTTCAAGTCCCTCTATCCCCCAT------------AAAAAGCCCATT-TT   {1257}
D.polybulbon_94               GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1316}
E.adenocaula_12               GATCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCAT?-TT   {1301}
E.bractescens_21              GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATTATT   {1336}
E.aromatica_02                GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCC-ATT-TA   {1337}
E.cordigera_24                GTTCAAGTCCCTCTATCCCCCAT------------AAAAAGCCCATT-TT   {1329}
E.tampensis_27                GTTCAAGTCCCTCTATCCCCCAT------------AAAAAGCCCATT-TA   {1333}
E.tampensis_alba_23           GTTCAAGTCCCTCTATCCCCCAT------------AAAAAGCCCATT-TT   {1337}
E.dichroma_74                 GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1313}
E.diurna_09                   GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TA   {1336}
E.asperula_65                 GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1335}
E.candollei_29                GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1322}
E.randii_50                   GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1339}
E.kienastii_235               GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1316}
P.chimborazoensis_51          GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCC-ATT-TT   {1309}
P.fragrans_172                GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1318}
P.aemula_17                   GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1309}
P.cochleata_31                GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1333}
P.pygmaea_81                  GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1322}
P.pseudopygmaea_205           GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1324}
P.vitellina_57                GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1326}
P.glauca_176                  GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1325}
P.ionocentra_46               GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1331}
P.prismatocarpa_19            GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1327}
P.ochracea_95                 GTTCAAGTCCCTCTATCCCCCAT------------AAAAAGCC-ATT--T   {1304}
P.cretacea_230                GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1323}
E.luteorosea_178              GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGTCCATT-TT   {1319}
E.luteorosea_173              GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGTCCATT-TT   {1319}
E.subulatifolia_128           GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1324}
E.subulatifolia_174           GTTCAAGTCCCTCTATCCCCGAT------------AAAAAGCCCATT-TT   {1325}
E.cyanocolumna_1001           GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATT-TT   {1320}
E.tenuissima_143              GTTCAAGTCCCTCTATCCCCAAT------------AAAAAGCCCATG-TT   {1135}
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Appendix G—continued.

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{                                             1910      1920      1930      1940      1950}
{                                                .         .         .         .         .}
Restrepiella_291            A------------CTT--CCTCGCTC-TTTATTTATCCTCGTCCCCTTT    {1537}
Pluer.racemiflora_140       A------------CTT-CCCTCGCTC-TTTATTTATCCTCGTCCTCTTT    {1479}
Ponera.striata_197          AAAGCCC-ATTTTACTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1517}
Isochilis.major_279         -------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1643}
Epi.ibaguense_60            A------------CTT--CC-CGCTC-TTTATTTATCCTCATCCTCTTT    {1364}
Epi.conopseum_244           A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1347}
Nidema.boothii_192          A------------CTC--CCTCGCTC-TTTATTTATCCTCATCCTCTTC    {1352}
S._pulchella_W208           A------------CTT--CCTCGCTC-TTTCTTTATCCTCATCCTCTTT    {1343}
H.imbricata_283             A------------CTT--CCTCGCTC-TTTCTTTATCCTCATCCTCTTT    {1353}
Reichenbachanthus_W107      A------------CTTT--CTCGCTC-TTTCTTTATCCTCATCCTCTTT    {1342}
Hexadesmia_K336             A------------CTT--CCTCGCTC-TTTCTTTATCCTCATCCTCTTT    {1354}
Acrorchis_399               A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1348}
Jacquiniella_313            A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1354}
Hagsatera_229               A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1357}
Homalopetalum_234           A-------ATTTTACTT--CTTCGCTC-TTTATTTATCCTCATCCTCTTT    {1356}
Meiracyllium_trinas_129     A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1345}
Psy.mcconnelliae_W53R       A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1355}
Psy.krugii_62               A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1357}
Brough.nigrilensis_152      A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1356}
Tetramica.elegans_160       A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1359}
Domingoa_225                A------------CTT--CTTCGCTCT-TTATTTATCCTCATCCTCTTT    {1358}
Cattleyopsis_251            A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1365}
Brassav.cucullata_130       A------------CTT--CCTCGCTC-TTTATTTATCCTCATTCTCTTT    {1354}
L.rubescens_w284            A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1349}
Myrmecophila_281            A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1337}
C.dowiana_282               A------------CTT--CCTCGCTC-TTTATTTATCCTCATACTCTTT    {1331}
Rhy.glauca_N134             A------------CTT--CCTCGCTCT-TTATTTATCCTCATCCTCTTT    {1355}
C.forbesii_59               A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1298}
Soph.cernua_145             A------------CTT--CTTCGCTC-TTTATTTATCCTCATCCTCTTT    {1354}
L.purpurata_84              A------------CTT--CCTCGCTC-TTTATTTATCCTCACCCTCTTT    {1364}
Schm.splendida_280          A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1350}
E.citrina_54                A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1362}
E.mariae_56                 A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1340}
E.mariae_87                 A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1356}
D.polybulbon_61             A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1291}
D.polybulbon_94             A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1350}
E.adenocaula_12             A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1335}
E.bractescens_21            A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1370}
E.aromatica_02              A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1371}
E.cordigera_24              A------------CT---CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1362}
E.tampensis_27              A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTT-    {1366}
E.tampensis_alba_23         A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1371}
E.dichroma_74               A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1347}
E.diurna_09                 A------------CTT--CCTCGCTC-TTAATTTATCCTCATCCTCTTT    {1370}
E.asperula_65               A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1369}
E.candollei_29              A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1356}
E.randii_50                 A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1373}
E.kienastii_235             A------------CTT--CCTCGCTCT-TTATTTATCCTCATCCTTTTT    {1350}
P.chimborazoensis_51        A------------TT---CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1342}
P.fragrans_172              A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1352}
P.aemula_17                 A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1343}
P.cochleata_31              A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1367}
P.pygmaea_81                A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1356}
P.pseudopygmaea_205         A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1358}
P.vitellina_57              A------------CTT--CCTCGCTC-CTTATTTATCCTCATCCTCTTT    {1360}
P.glauca_176                A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1359}
P.ionocentra_46             A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1365}
P.prismatocarpa_19          A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1361}
P.ochracea_95               A------------CT---CGTCGCTC-TTTCTTTATCCTCATCCTCTTT    {1337}
P.cretacea_230              A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1357}
E.luteorosea_178            A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1353}
E.luteorosea_173            A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1353}
E.subulatifolia_128         A------------CTT--CCTCGCTC-TTTCTTTATCCTCATCCTCTTT    {1358}
E.subulatifolia_174         A------------CTT--CCTCGCTC-TTTCTTTATCCTCAGCCTCTTT    {1359}
E.cyanocolumna_1001         A------------CTT--CCTCGCTCT-TTATTTATCCTCATCCTCTTT    {1354}
E.tenuissima_143            A------------CTT--CCTCGCTC-TTTATTTATCCTCATCCTCTTT    {1169}
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Appendix G—continued.

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{                                         1960      1970      1980      1990      2000}
{                                            .         .         .         .         .}
Restrepiella_291                 CTTTTTTTTTTT--CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1577}
Pluer.racemiflora_140            CTTTTTTTTTTT--CAT-------CAGGGGCTCAGTTTCAA-CAAAATGA   {1519}
Ponera.striata_197               CTTTTTTTT-----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1554}
Isochilis.major_279              CTTTTTTTT-----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1680}
Epi.ibaguense_60                 CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1402}
Epi.conopseum_244                CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1385}
Nidema.boothii_192               CTTTTTTTTTTT--CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1392}
S._pulchella_W208                CTTTTTTTTTTTT-CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1384}
H.imbricata_283                  CTTTTTTTTTT---CAT-------CAGTGGCTCAGTTTAAA-CAAACTGA   {1392}
Reichenbachanthus_W107           CTTTTTTTTTTT--CAT-------C-------------------------   {1358}
Hexadesmia_K336                  CTTTTTTTTTTT--CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1394}
Acrorchis_399                    CTTTTTTTTTT---CAT-------CATTGGCTCAGTTTAAA-CAAACTGA   {1387}
Jacquiniella_313                 CTTTTTTTTTTT--CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1394}
Hagsatera_229                    CTTTTTTTTTT---CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1396}
Homalopetalum_234                CTTTTTTTTTT---CAT-------CAGTGGCTCAGTTTCAA-CAAAATGA   {1395}
Meiracyllium_trinas_129          CTTTTTTTTTT---CATTTTTCATCAGTGGCTCAGTTTAAA-CAAAATGA   {1391}
Psy.mcconnelliae_W53R            CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1393}
Psy.krugii_62                    CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1395}
Brough.nigrilensis_152           CTTTTTTT------CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1392}
Tetramica.elegans_160            CTTTTTTTTTT---CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1398}
Domingoa_225                     CTTTTTTTTTT---CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1397}
Cattleyopsis_251                 CTTTTTTT------CAT-------CAGCGGCTCAGTTTAAA-CAAAATGA   {1401}
Brassav.cucullata_130            CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1392}
L.rubescens_w284                 CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1387}
Myrmecophila_281                 CTTTTTTTTTTT--CAT-------CAGTGGCTCAGTTGAAA-CAAACTGA   {1377}
C.dowiana_282                    CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1369}
Rhy.glauca_N134                  CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1393}
C.forbesii_59                    CTTTTTTTTTTT--CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1338}
Soph.cernua_145                  CTTTTTTTTTTT--CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1394}
L.purpurata_84                   CTTTYTTTTTT---CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1403}
Schm.splendida_280               CTTTTTTTTTTTT-CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1391}
E.citrina_54                     CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1400}
E.mariae_56                      CTTTTTTTT-----CAT-------CAGTGGCTCAGTTTAAA-CAAACTGA   {1377}
E.mariae_87                      CTTTTTTTT-----CAT-------CAGTGGCTCAGTTTAAA-CAAACTGA   {1393}
D.polybulbon_61                  CTTTTTTTTTTT-CCAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1332}
D.polybulbon_94                  CTTTTTTTTTTTT-CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1391}
E.adenocaula_12                  CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1373}
E.bractescens_21                 CTTTTTTTT-----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1407}
E.aromatica_02                   CTTTTTTTTTT---CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1410}
E.cordigera_24                   CTTTTTTTTTT---CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1401}
E.tampensis_27                   CTTTTTTTTTTTTCCAT-------CAGTGGCTCAGTTTAAAACAAAATGA   {1409}
E.tampensis_alba_23              CTTTTTTTTTTTTCCAT-------CAGTGGCTCAGTTTAAAACAAAATGA   {1414}
E.dichroma_74                    CTTTTTTTT-----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1384}
E.diurna_09                      CTTGTTTTTTT--CCAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1410}
E.asperula_65                    CTTTTTTTTTT---CAT-------CAGTGGCTCAGTTTAAA-CGAAATGA   {1408}
E.candollei_29                   CTTTTTTTTTTT--CAT-------CAGTGTCTCAGTTTAAA-CAAAATGA   {1396}
E.randii_50                      CTTTTTTTTTT---CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1412}
E.kienastii_235                  CTTTTTTTT-----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1387}
P.chimborazoensis_51             CTTTTTTTTTTT--CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1382}
P.fragrans_172                   CTTTTTTTTTTT--CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1392}
P.aemula_17                      CTTTTTTTTTTT--CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1383}
P.cochleata_31                   CTTTTTTTTTT---CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1406}
P.pygmaea_81                     CTTTTTTTTTTT--CAT-------CAGTAGCTCAGTTTAAA-CAAAATTA   {1396}
P.pseudopygmaea_205              CTTTTTTTTTTT--CAT-------CAGTAGCTCAGTTTAAA-CAAAAGTA   {1398}
P.vitellina_57                   CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1398}
P.glauca_176                     CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1397}
P.ionocentra_46                  CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1403}
P.prismatocarpa_19               CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1399}
P.ochracea_95                    CTTTTTTTTTTT-CCAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1378}
P.cretacea_230                   CTTTTTTTTT----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1395}
E.luteorosea_178                 CTTTTTCTTTTT--CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1393}
E.luteorosea_173                 CTTTTTCTTTTT--CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1393}
E.subulatifolia_128              CTTTTTTTT-----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1395}
E.subulatifolia_174              CTTTTTTTT-----CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1396}
E.cyanocolumna_1001              CTTTTTTTTTTTT-CAT-------CAGTGGCTCAGTTTAAA-CAAAATGA   {1395}
E.tenuissima_143                 CTTTTTTTTTT---CAT-------CAGTGGCTCAGTTTAAA-CAAACTGA   {1208}
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Appendix G—continued.

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{                                          2010      2020      2030      2040      2050}
{                                             .         .         .         .         .}
Restrepiella_291             ACTATCGTTCTCATTTCATTCACTCTGTTCTTTCACAAAAGGATCCGAAT   {1627}
Pluer.racemiflora_140        AATATCGTTCTAATTTTATTCACTCTTTTCTTTCACAAATGAATCCGAAT   {1569}
Ponera.striata_197           AATATTGTTCTAATTTCATTCACTCTGTTCTTTCACAAATGGATCCGA--   {1602}
Isochilis.major_279          AATATTGTTCTAATTTCATTCACTCTGTTCTTTCACAAATGGATCCGA--   {1728}
Epi.ibaguense_60             AATATCGTTCTAATTTCATTTACTCTGTTCTTTTACAAAAGGATACAAAT   {1452}
Epi.conopseum_244            AATATCGTTCTAATTTCATTTACTCT------------------------   {1411}
Nidema.boothii_192           AATTAGAACGATATTTCATTTACTCTGTCCTTTCACAAAAGGATCCAAAT   {1442}
S._pulchella_W208            AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1434}
H.imbricata_283              AATATCGTTCTAATTTAAATTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1442}
Reichenbachanthus_W107       -------------TTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1395}
Hexadesmia_K336              AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1444}
Acrorchis_399                AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1437}
Jacquiniella_313             AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1444}
Hagsatera_229                AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1446}
Homalopetalum_234            AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1445}
Meiracyllium_trinas_129      AATATCGTTCTAATTTCATTTATTCT-TTTTTTCACAAAAGGATACAAAT   {1440}
Psy.mcconnelliae_W53R        AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1443}
Psy.krugii_62                AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1445}
Brough.nigrilensis_152       AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1442}
Tetramica.elegans_160        AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1448}
Domingoa_225                 AATATCGTTCTAATTTCATTTACTCTGTCCTTTCACAAAAGGATCCAAAT   {1447}
Cattleyopsis_251             AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1451}
Brassav.cucullata_130        AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATACAAAT   {1442}
L.rubescens_w284             AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATACAAAT   {1437}
Myrmecophila_281             AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATACAAAT   {1427}
C.dowiana_282                AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATACAAAT   {1419}
Rhy.glauca_N134              AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATACAAAT   {1443}
C.forbesii_59                AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATACAAAT   {1388}
Soph.cernua_145              AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGAATACAAAT   {1444}
L.purpurata_84               AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATACAAAT   {1453}
Schm.splendida_280           AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATACAAAT   {1441}
E.citrina_54                 AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1450}
E.mariae_56                  AATATCGTTCTAATTTCATTTACTCTGTTTTTTCACAAAAGGATCCAAAT   {1427}
E.mariae_87                  AATATCGTTCTAATTTCATTTACTCTGTTTTTTCACAAAAGGATCCAAAT   {1443}
D.polybulbon_61              AATTAGAACGATATTTCATTTACTCTGTTCTTTTACAAAAGGATCCAAAT   {1382}
D.polybulbon_94              AATTAGAACGATATTTCATTTACTCTGTTCTTTTACAAAAGGATCCAAAT   {1441}
E.adenocaula_12              AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCAAAAT   {1423}
E.bractescens_21             AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCAAAAT   {1457}
E.aromatica_02               AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCAAAAT   {1460}
E.cordigera_24               AATATCGTTCGAATTTCATTTACTCTGTTCTTTCACAAAAGCATCCAAAT   {1451}
E.tampensis_27               AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCAAAAT   {1459}
E.tampensis_alba_23          AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCAAAAT   {1464}
E.dichroma_74                AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCAAAAT   {1434}
E.diurna_09                  AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCAAAAT   {1460}
E.asperula_65                AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCAAAAT   {1458}
E.candollei_29               AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCAAAAT   {1446}
E.randii_50                  AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATAAAAAT   {1462}
E.kienastii_235              AATATCGTTCTAATTTCATTTAGTCTGTTCTTTCACAAAAGGATACAAAT   {1437}
P.chimborazoensis_51         AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1432}
P.fragrans_172               AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1442}
P.aemula_17                  AATATCGTTCTAATTTCATTTACTCTGTTCTTTCTCAAATGGATCCAAAT   {1433}
P.cochleata_31               AATATCGTTCTAATTTCATTTACTCTGTTCTTTTACAAAAGGATCAAAAT   {1456}
P.pygmaea_81                 AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCAAAAT   {1446}
P.pseudopygmaea_205          AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCAAAAT   {1448}
P.vitellina_57               AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1448}
P.glauca_176                 AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1447}
P.ionocentra_46              AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1453}
P.prismatocarpa_19           AATATCGTTCTAATTTAATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1449}
P.ochracea_95                AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1428}
P.cretacea_230               AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1445}
E.luteorosea_178             AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1443}
E.luteorosea_173             AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1443}
E.subulatifolia_128          AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATACAAAT   {1445}
E.subulatifolia_174          AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATACAAAT   {1446}
E.cyanocolumna_1001          AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1445}
E.tenuissima_143             AATATCGTTCTAATTTCATTTACTCTGTTCTTTCACAAAAGGATCCAAAT   {1258}
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Appendix G—continued.

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{                                         2060      2070      2080      2090      2100}
{                                            .         .         .         .         .}
Restrepiella_291               AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1669}
Pluer.racemiflora_140          AGAAAT-----CCTCGT-TCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1610}
Ponera.striata_197             --------------------------------------------------   {1602}
Isochilis.major_279            --------------------------------------------------   {1728}
Epi.ibaguense_60               AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATTTGTTTTTT   {1496}
Epi.conopseum_244              ---------------------------AAATCCAATCTCATTTGTTTTTT   {1434}
Nidema.boothii_192             AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1484}
S._pulchella_W208              AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1476}
H.imbricata_283                AGAAAT-----CCTCGTATCTTCATTCCAATCCAATCTCATTTGTTTT--   {1485}
Reichenbachanthus_W107         AGAAAT-----CCTCGTATCTTC-TTCCAATACAATCTCATTTGTTTT--   {1437}
Hexadesmia_K336                AGAAAT------CTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1485}
Acrorchis_399                  AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1479}
Jacquiniella_313               AGAAAT-----CCTCGTATCTT-ATTCCAATCCAATCTCATTTGTTTT--   {1486}
Hagsatera_229                  AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1488}
Homalopetalum_234              AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1487}
Meiracyllium_trinas_129        AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1482}
Psy.mcconnelliae_W53R          AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1485}
Psy.krugii_62                  AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1487}
Brough.nigrilensis_152         AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1484}
Tetramica.elegans_160          AGAAAT-----CCTCGTATCTTC-TTCCAATACAATCTCATTTGTATT--   {1490}
Domingoa_225                   AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1489}
Cattleyopsis_251               AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1493}
Brassav.cucullata_130          AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1484}
L.rubescens_W284               AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1479}
Myrmecophila_281               AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTTT-----   {1466}
C.dowiana_282                  AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1461}
Rhy.glauca_N134                AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1485}
C.forbesii_59                  AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1430}
Soph.cernua_145                AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1486}
L.purpurata_84                 AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTG--   {1495}
Schm.splendida_280             AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1483}
E.citrina_54                   AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1492}
E.mariae_56                    AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1469}
E.mariae_87                    AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1485}
D.polybulbon_61                AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1424}
D.polybulbon_94                AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1483}
E.adenocaula_12                AGAAAT-----CCTCGTATCTT-AT-CC-----AATCTCATTTGTTTT--   {1459}
E.bractescens_21               AGAAAT-----CCTCGTATCTT-AT-CC-----AATCTCATTTGTTTT--   {1493}
E.aromatica_02                 AGAAAT-----CCTCGTATCTT-AT-CC-----AATCTCATTTGTTTT--   {1496}
E.cordigera_24                 AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1493}
E.tampensis_27                 AGAAATY----CCTCGTATCTT-AT-CC-----AATCTCATTTGTTTT--   {1496}
E.tampensis_alba_23            AGAAAT-----CCTCGTATCTT-AT-CC-----AATCTCATTTGTTTT--   {1500}
E.dichroma_74                  AGAAAT-----CCTCGTATCTT-AT-CC-----AATCTCATTTGTTTT--   {1470}
E.diurna_09                    AGAAAT-----CCTCGTATCTT-AT-CC-----AATCTCATTTGTTTT--   {1496}
E.asperula_65                  AGAAAT-----CCTCGTATCTT-AT-CC-----AATCTCATTTGTTTT--   {1494}
E.candollei_29                 AGAAAT-----CCTCGTATCTT-AT-CC-----AATCTCATTTGTTTT--   {1482}
E.randii_50                    AGAAAC-----CCTCGTATCTT-AT-CC-----AATCTCATTTGTTTT--   {1498}
E.kienastii_235                AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1479}
P.chimborazoensis_51           AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1474}
P.fragrans_172                 AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1484}
P.aemula_17                    AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1475}
P.cochleata_31                 AGAAAT-----CCTCATATCTTC-TTTCAATCCAATCTCATTTGTTTT--   {1498}
P.pygmaea_81                   AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATT-GTGTT--   {1487}
P.pseudopygmaea_205            AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1490}
P.vitellina_57                 AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATTCGTTTT--   {1490}
P.glauca_176                   AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1489}
P.ionocentra_46                AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1495}
P.prismatocarpa_19             AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1491}
P.ochracea_95                  AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1470}
P.cretacea_230                 AGAAAT-----CCTCATATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1487}
E.luteorosea_178               AGAAAT-----CCTCGTATCTTC-TTCCAATACAATCTCATTTGTTTT--   {1485}
E.luteorosea_173               AGAAAT-----CCTCGTATCTTC-TTCCAATACAATCTCATTTGTTTT--   {1485}
E.subulatifolia_128            AGAAATCCT--CCTCGTATCTTC-TTCCAATCCAATCTCTTTTGTTTT--   {1490}
E.subulatifolia_174            AGAAATCCT--CCTCGTATCTTC-TTCCAATCCAATCTCTTTTGTGTT--   {1491}
E.cyanocolumna_1001            AGAAATCCTCGTATCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1492}
E.tenuissima_143               AGAAAT-----CCTCGTATCTTC-TTCCAATCCAATCTCATTTGTTTT--   {1300}
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Appendix G—continued.

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{                                        2110      2120      2130      2140      2150}
{                                           .         .         .         .         .}
Restrepiella_291              -----------------GTATAA---------------TATGATATGAAC  {1687}
Pluer.racemiflora_140         -----------------GTATAA---------------TATGATATGATA  {1628}
Ponera.striata_197            --------------------------------------TACGATATGAAC  {1614}
Isochilis.major_279           --------------------------------------TACGATATGAAC  {1740}
Epi.ibaguense_60              TTTGTTTTGTATAATTTGTATAA---------------TATGATATGAAC  {1531}
Epi.conopseum_244             T--GTTTT---------GTATAA---------------TACGATATGAAC  {1458}
Nidema.boothii_192            -----------------GTATAA---------------TACGATATGAAC  {1502}
S._pulchella_W208             -----------------GTATAA---------------TACGATATGAAC  {1494}
H.imbricata_283               -----------------GTATAA---------------TACGATATGAAC  {1503}
Reichenbachanthus_W107        -----------------GTATAA---------------TACGATATGAAC  {1455}
Hexadesmia_K336               -----------------GTATAA---------------TACGATATGAAC  {1503}
Acrorchis_399                 -----------------GTATAA---------------TACGATATGAAC  {1497}
Jacquiniella_313              -----------------GTATAA---------------TACGATATGAAC  {1504}
Hagsatera_229                 -----------------GTATAA---------------TACGATATGAAC  {1506}
Homalopetalum_234             -----------------GTATAA---------------TACGATATGAAC  {1505}
Meiracyllium_trinas_129       -----------------GTATAA---------------TACGATATGAAC  {1500}
Psy.mcconnelliae_W53R         -----------------GTATAA---------------TACGATATGAAC  {1503}
Psy.krugii_62                 -----------------GTATAA---------------TACGATATGAAC  {1505}
Brough.nigrilensis_152        -----------------GTATAA---------------TACGATATGAAC  {1502}
Tetramica.elegans_160         -----------------GTATAA---------------TACGATATGAAC  {1508}
Domingoa_225                  -----------------GTATAA---------------TACGATATGAAC  {1507}
Cattleyopsis_251              -----------------GTATAA---------------TACGATATGAAC  {1511}
Brassav.cucullata_130         -----------------GTATAA---------------TACGATATGAAC  {1502}
L.rubescens_w284              -----------------GTATAA---------------TACGATAGGAAC  {1497}
Myrmecophila_281              ------------GTTTTGTATAA---------------TACGATATGAAC  {1489}
C.dowiana_282                 -----------------GTATAA---------------TACGATATGAAC  {1479}
Rhy.glauca_N134               -----------------GTATAA---------------TACGATATGAAC  {1503}
C.forbesii_59                 -----------------GTATAA---------------TACGATATGAAC  {1448}
Soph.cernua_145               -----------------GTATAA---------------TACGATATGAAC  {1504}
L.purpurata_84                -----------------GTATAA---------------TACGATATGAAC  {1513}
Schm.splendida_280            -----------------GTATAA---------------TACGATATGAAC  {1501}
E.citrina_54                  -----------------GTATAA---------------TACGATATGAAC  {1510}
E.mariae_56                   -----------------GTATAA---------------TACGATATGAAC  {1487}
E.mariae_87                   -----------------GTATAA---------------TACGATATGAAC  {1503}
D.polybulbon_61               -----------------GTATAA---------------TACGATATGAAC  {1442}
D.polybulbon_94               -----------------GTATAA---------------TACGATATGAAC  {1501}
E.adenocaula_12               -----------------GTATAA---------------TACGATATGAAC  {1477}
E.bractescens_21              -----------------GTATRA---------------TACGATATGAAC  {1511}
E.aromatica_02                -----------------GTATAA---------------TACGATATGAAC  {1514}
E.cordigera_24                -----------------GTATAA---------------TACGATATGAAC  {1511}
E.tampensis_27                -----------------GTATAA---------------TACGATATGAAC  {1514}
E.tampensis_alba_23           -----------------GTATAA---------------TACGATATGAAC  {1518}
E.dichroma_74                 -----------------GTATAA------TTTGTATAATACGATATGAAC  {1497}
E.diurna_09                   -----------------GTATAA---------------TACGATATGAAC  {1514}
E.asperula_65                 -----------------GTATAA---------------TACGATATGAAC  {1512}
E.candollei_29                -----------------GTATAA---------------TACGATATGAAC  {1500}
E.randii_50                   -----------------GTATAA---------------TACGATATGAAC  {1516}
E.kienastii_235               -----------------GTATAA---------------TACGATATGAAC  {1497}
P.chimborazoensis_51          -----------------GTATAA---------------TATGATATGAAT  {1492}
P.fragrans_172                -----------------GTATAA---------------TATGATATGAAT  {1502}
P.aemula_17                   -----------------GTATAA---------------TATGATATGAAT  {1493}
P.cochleata_31                -----------------GTATAATATGATTTTGTATAATATGATATGAAC  {1531}
P.pygmaea_81                  --------------GTTGTATAA---------------TATGATATGAAC  {1508}
P.pseudopygmaea_205           -----------------GTATAA---------------TATGATATGAAC  {1508}
P.vitellina_57                -----------------GTATAATATGAT-ATGTATAATATGATATGAAC  {1522}
P.glauca_176                  -----------------GTATA------TTTTGTATAATATGATATGAAC  {1516}
P.ionocentra_46               --------GTATATTTTGTATAA---------------TATGATATGAAC  {1522}
P.prismatocarpa_19            -----------------GTATA------TTTTGTATAATATGATATGAAC  {1518}
P.ochracea_95                 -----------------GTATAA---------------TATGATATGAAC  {1488}
P.cretacea_230                -----------------GTATAA---------------TATGATATGAAC  {1505}
E.luteorosea_178              -----------------GTATAA---------------TACGATATGAAC  {1503}
E.luteorosea_173              -----------------GTATAA---------------TACGATATGAAC  {1503}
E.subulatifolia_128           -----------------GTATAA---------------TATGATATAAAC  {1508}
E.subulatifolia_174           -----------------GTATAA---------------TATGATATAAAC  {1509}
E.cyanocolumna_1001           -----------------GTATAA---------------TACGATATGAAC  {1510}
E.tenuissima_143              -----------------GTATAA---------------TACGATATGAAC  {1318}
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Appendix G—continued.

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{                                             2160      2170      2180      2190      2200}
{                                                .         .         .         .         .}
Restrepiella_291                   ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1726}
Pluer.racemiflora_140              TGATATGAACATATATGTTCAAGGAA-TCTCCGTTATTGACTCATTCATA   {1677}
Ponera.striata_197                 ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1653}
Isochilis.major_279                ATATATG----------TTCAAAGAA-TCTCCGTTATTGAATCATTCATA   {1779}
Epi.ibaguense_60                   ATATATG----------TTCAAGGGA-TCTCCGTTATTGAATCATTCATA   {1570}
Epi.conopseum_244                  ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1497}
Nidema.boothii_192                 ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATCCATA   {1541}
S._pulchella_W208                  ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATCCATA   {1533}
H.imbricata_283                    ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATCCATA   {1542}
Reichenbachanthus_W107             ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATCCATA   {1494}
Hexadesmia_K336                    ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATCCATA   {1542}
Acrorchis_399                      ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATCCATA   {1536}
Jacquiniella_313                   ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATCCATA   {1543}
Hagsatera_229                      ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1545}
Homalopetalum_234                  ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTAATA   {1544}
Meiracyllium_trinas_129            ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1539}
Psy.mcconnelliae_W53R              ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1542}
Psy.krugii_62                      ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1544}
Brough.nigrilensis_152             ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1541}
Tetramica.elegans_160              ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1547}
Domingoa_225                       ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1546}
Cattleyopsis_251                   ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1550}
Brassav.cucullata_130              ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1541}
L.rubescens_w284                   ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1536}
Myrmecophila_281                   ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1528}
C.dowiana_282                      ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1518}
Rhy.glauca_N134                    ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1542}
C.forbesii_59                      ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1487}
Soph.cernua_145                    ATATATA----TATATGTTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1549}
L.purpurata_84                     ATATATA----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1552}
Schm.splendida_280                 ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1540}
E.citrina_54                       ATATATG----------TTCAAGGAAATCTCCGTTATTGAATCATTCATA   {1550}
E.mariae_56                        ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1526}
E.mariae_87                        ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1542}
D.polybulbon_61                    ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATCCATA   {1481}
D.polybulbon_94                    ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATCCATA   {1540}
E.adenocaula_12                    ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1516}
E.bractescens_21                   ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1550}
E.aromatica_02                     ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1553}
E.cordigera_24                     ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1550}
E.tampensis_27                     ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1553}
E.tampensis_alba_23                ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1557}
E.dichroma_74                      ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1536}
E.diurna_09                        ATATATG----------TTCAAGGA-TTCTCCGTTATTGAATCATTCATA   {1553}
E.asperula_65                      ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1551}
E.candollei_29                     ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1539}
E.randii_50                        ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1555}
E.kienastii_235                    ATATATG----------TTCATAGAA-TCTCCGTTATTGAATCATTCATA   {1536}
P.chimborazoensis_51               ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1531}
P.fragrans_172                     ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1541}
P.aemula_17                        ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1532}
P.cochleata_31                     ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1570}
P.pygmaea_81                       ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATC   {1547}
P.pseudopygmaea_205                ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATC   {1547}
P.vitellina_57                     ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1561}
P.glauca_176                       ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1555}
P.ionocentra_46                    ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1561}
P.prismatocarpa_19                 ATATATG----------TTCAAGGAA-TCTCCGTTATTAAATCATTCATA   {1557}
P.ochracea_95                      ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1527}
P.cretacea_230                     ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1544}
E.luteorosea_178                   ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1542}
E.luteorosea_173                   ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1542}
E.subulatifolia_128                ATATATG----------TTCAAGGAA-TCTCCGTTATTGAATCATTCATA   {1547}
E.subulatifolia_174                ATATATG----------TCCAGGGAA-TCTCCGTTATTGAATCATTCATA   {1548}
E.cyanocolumna_1001                ATATATG----------TTCAAAGAA-TCTCCGTTATTGAATCATTCATA   {1549}
E.tenuissima_143                   ATATATG----------TTCAAAGAA-TCTCCGTTATTGAATCATTCATA   {1357}
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Appendix G—continued.

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{                                     2210      2220      2230      2240      2250}
{                                        .         .         .         .         .}
Restrepiella_291              GTACATA-------TATTTTTCCT-------ACAAA---------AAGAG   {1753}
Pluer.racemiflora_140         GTCCATA-------TCTTTTTCCTTACATTAAAAAA--------AAAAAG   {1712}
Ponera.striata_197            GTCCATA-------TCTTTTTTATTACATTTACAAA---------TAAAA   {1687}
Isochilis.major_279           GTCCATATA-------TTTTTTCTTACATTTACAAA---------GAAAG   {1813}
Epi.ibaguense_60              GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1604}
Epi.conopseum_244             GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1531}
Nidema.boothii_192            GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GGAAG   {1575}
S._pulchella_W208             GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1567}
H.imbricata_283               GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1576}
Reichenbachanthus_W107        GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1528}
Hexadesmia_K336               GTGCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1576}
Acrorchis_399                 -TA-----------TCTTTTTCCTTACATTTACAAA-----------AAG   {1563}
Jacquiniella_313              GTCCATA-------TCTTTTTCCTTACATTTACAAA-----------AAG   {1575}
Hagsatera_229                 GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1579}
Homalopetalum_234             GTCCATA-------TCTTTTTCCTTACATTTACAAA---------AAGAG   {1578}
Meiracyllium_trinas_129       GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1573}
Psy.mcconnelliae_W53R         GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1576}
Psy.krugii_62                 GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1578}
Brough.nigrilensis_152        GTCCATA-------TCTTTTTCCTTACATTTACAAA---------AAAAG   {1575}
Tetramica.elegans_160         GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1581}
Domingoa_225                  GTTCATA-------TTTTTTTCCTTACATTTACAAA---------GAAAG   {1580}
Cattleyopsis_251              GTCCATA-------TCTTTTTCCTTACATTTACAAAAAATACAAAAAAAG   {1593}
Brassav.cucullata_130         GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1575}
L.rubescens_w284              GTCCATT-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1570}
Myrmecophila_281              GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1562}
C.dowiana_282                 GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1552}
Rhy.glauca_N134               GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1576}
C.forbesii_59                 GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1521}
Soph.cernua_145               GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GGAAG   {1583}
L.purpurata_84                GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1586}
Schm.splendida_280            GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1574}
E.citrina_54                  GTCCATA-------TCTTTTTCCTTACATTTACAAA---------TAGAG   {1584}
E.mariae_56                   GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1560}
E.mariae_87                   GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1576}
D.polybulbon_61               GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GGAAG   {1515}
D.polybulbon_94               GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GGAAG   {1574}
E.adenocaula_12               GTCCA-----------------CTTACATTTACAAA---------GAAAG   {1540}
E.bractescens_21              GTCCA-----------------CTTACATTTACAAA---------GAAAG   {1574}
E.aromatica_02                GTCCA-----------------CTTACATTTACAAA---------GAAAG   {1577}
E.cordigera_24                GTCCA-----------------CTTACATTTACAAA---------GAAAG   {1574}
E.tampensis_27                GTCCA-----------------CTTACATTTACAAA---------GAAAG   {1577}
E.tampensis_alba_23           GTCCA-----------------CTTACATTTACAAA---------GAAAG   {1581}
E.dichroma_74                 GTCCA-----------------CTTACATTTACAAA---------GAAAG   {1560}
E.diurna_09                   GTCCA-----------------CTTACATTTACAAA---------GAAAG   {1577}
E.asperula_65                 GTCCA-----------------CTTACATTTACAAA---------GAAAG   {1575}
E.candollei_29                GTCCA-----------------CTTACATTTACAAA---------GAAAG   {1563}
E.randii_50                   GTCCA-----------------CTTACATTTACAAA---------GAAAG   {1579}
E.kienastii_235               GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1570}
P.chimborazoensis_51          GTCCATA-------TCTTTTTCCTTACATTTACAAA---------TAAAG   {1565}
P.fragrans_172                GTCCATA-------TCTTTTTCCTTACATTTACAAA---------TAAAG   {1575}
P.aemula_17                   GTCCATA-------TCTTTTTCCTTACATTTACAAA---------TAAAG   {1566}
P.cochleata_31                GTTCATA-------TCTTTTTCCTTACATTTACAAA---------TAAAG   {1604}
P.pygmaea_81                  ATTCATAGTCCATATCTTTTTCCTTACATTTACAAA---------TAAAG   {1588}
P.pseudopygmaea_205           ATTCATAGTCCATATCTTTTTCCTTACATTTACAAA---------TAAAG   {1588}
P.vitellina_57                GTCCATA-------TCTTTTTCCTTACATTTACAAA---------TAAAG   {1595}
P.glauca_176                  GTCCATA-------TCTTTTTCCTTACATTTACAAA---------TAAAG   {1589}
P.ionocentra_46               GTCCATA-------TCTTTTTCCTTACATTTACAAA---------TAAAG   {1595}
P.prismatocarpa_19            GTCCATA-------TCTTTTTCCTTACATTTACAAA---------TAAAG   {1591}
P.ochracea_95                 GCCCATA-------TCTTTTTCCTTACATTTACAAA---------TAAAG   {1561}
P.cretacea_230                GTCCATA-------TCTTTTTCCTTACATTTACAAA---------TAAAG   {1578}
E.luteorosea_178              GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1576}
E.luteorosea_173              GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1576}
E.subulatifolia_128           GTCCATA-------TCTTTTTCCTTACATTTACAAATAC-AAA--GAAAG   {1587}
E.subulatifolia_174           GTCCATA-------TCTTTTTCCTTACATATACAAATACTAAA--GAAAG   {1589}
E.cyanocolumna_1001           GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1583}
E.tenuissima_143              GTCCATA-------TCTTTTTCCTTACATTTACAAA---------GAAAG   {1391}
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Appendix G—continued.

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{                                   2260      2270      2280      2290      2300}
{                                      .         .         .         .         .}
Restrepiella_291                TCTTCTTTTTGAA-TATCTAAGAAATTC-AGGGG-CTAGGGCCGATTTGT   {1800}
Pluer.racemiflora_140           TCTTCTTTTTGAA-TATCTAAGAAATTC-AGGGG-CTAGGGCCGATTTGT   {1759}
Ponera.striata_197              TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGG-CCCATTTGT   {1733}
Isochilis.major_279             TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1860}
Epi.ibaguense_60                TCTTCTCTTTGAA-AATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1651}
Epi.conopseum_244               TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1578}
Nidema.boothii_192              TCTTCTTTTTGAA-GATCTAAAAGATTC-AGGGG-CTAGGGCCAATTTGT   {1622}
S._pulchella_W208               TCTTCTTTTTGAA-GATCTAAGAAATTC-GGGGG-CTAGGGCCAATTTGT   {1614}
H.imbricata_283                 TCTTCTTTTTGAA-GATCTAAGAAATTC-GGGGG-CTAGGGCCAATTTGT   {1623}
Reichenbachanthus_W107          TCTTCTTTTTTAA-GATCTAAGAAATTC-GGGGG-TTAGG-CCAATTTGT   {1574}
Hexadesmia_K336                 TCTTCTTTTTGAA-GATCTAAGAAATTC-GGGGG-CTAGGGCCAATTTGT   {1623}
Acrorchis_399                   TCTTCTTTTTGAA-GATCTAAGAAATTC-GGGGG-CTAGGGCCAATTTGT   {1610}
Jacquiniella_313                TTTTCTTTTTGAA-GATCTAAGAAATTC-GGGGG-CTAGG-CCAATTTGT   {1621}
Hagsatera_229                   TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAAGGCCAATTTGT   {1626}
Homalopetalum_234               TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGAGCCAATTTGT   {1625}
Meiracyllium_trinas_129         TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1620}
Psy.mcconnelliae_W53R           TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGG-CCAATTTGT   {1622}
Psy.krugii_62                   TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGG-CCAATTTGT   {1624}
Brough.nigrilensis_152          TCTTCTTTTTGAA-GATCTAAGAAATTA-AGGGG-CTAGG-CCAATTTGT   {1621}
Tetramica.elegans_160           TCTTCTTTTTGAA-GATCTAAAAAATTC-AGGGG-CTAGG-CCAATTTGT   {1627}
Domingoa_225                    TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1627}
Cattleyopsis_251                TCTTCTTTTTGAA-GATCTAAGAAATTA-AGGGG-CTAGG-CCAATTTGT   {1639}
Brassav.cucullata_130           TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1622}
L.rubescens_w284                TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1617}
Myrmecophila_281                TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGG-CCAATTTGT   {1608}
C.dowiana_282                   TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGG-CCAATTTGT   {1598}
Rhy.glauca_N134                 TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1623}
C.forbesii_59                   TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGG-CCAATTTGT   {1567}
Soph.cernua_145                 TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGG-CCAATTTGT   {1629}
L.purpurata_84                  TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGG-CCAATTTGT   {1632}
Schm.splendida_280              TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1621}
E.citrina_54                    TCTTCTTTTTGAA-AATCTAAGAAATTC-AGGGG-CTAGGGCTAATTTGT   {1631}
E.mariae_56                     TCTTCTTTTTGAA-AATCTCAGAAATTC-AGGGG-CTAGGGCTAATTTGT   {1607}
E.mariae_87                     TCTTCTTTTTGAA-AATCTCAGAAATTC-AGGGG-CTAGGGCTAATTTGT   {1623}
D.polybulbon_61                 TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1562}
D.polybulbon_94                 TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1621}
E.adenocaula_12                 TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1587}
E.bractescens_21                TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1621}
E.aromatica_02                  TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1624}
E.cordigera_24                  TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1621}
E.tampensis_27                  TCTTCTTTTTGAA-GATCTAAGAAATTCCAGGGG-CTAGGGCCAATTTGT   {1625}
E.tampensis_alba_23             TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1628}
E.dichroma_74                   TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1607}
E.diurna_09                     TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1624}
E.asperula_65                   TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1622}
E.candollei_29                  TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1610}
E.randii_50                     TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1626}
E.kienastii_235                 TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-TTAGG-CCAATTTGT   {1616}
P.chimborazoensis_51            TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1612}
P.fragrans_172                  TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1622}
P.aemula_17                     TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCCATTTGT   {1613}
P.cochleata_31                  TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1651}
P.pygmaea_81                    TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1635}
P.pseudopygmaea_205             TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1635}
P.vitellina_57                  TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGG-CCAATTTGT   {1641}
P.glauca_176                    TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGCCCAATTTGT   {1636}
P.ionocentra_46                 TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1642}
P.prismatocarpa_19              TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1638}
P.ochracea_95                   TCTTCTTTTTGAA-GATATAAGAAATTC-AGGGG-CTAGGGCCGATTTGT   {1608}
P.cretacea_230                  TCTTCTTTTTGAAAGATCTAAGAAATTC-AGGGG-CTAGGGCCAATTTGT   {1626}
E.luteorosea_178                TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGG-CTAATTTGT   {1622}
E.luteorosea_173                TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGG-CTAATTTGT   {1622}
E.subulatifolia_128             TCTTCTTTTTGAA-GATCTAAGAAATTT-AGGGG-CTAGG-CCAATTTGT   {1633}
E.subulatifolia_174             TCTTCTATTTGAA-GATCTAAGAGATTT-AGGGG-CTAGG-CCAATTAGT   {1635}
E.cyanocolumna_1001             TCTTCTTTTTGAA-GATCTAAGAAATTC-AGGGG-CTAGGGGCAATTTGT   {1630}
E.tenuissima_143                TCTTCTTTTTGAA-GATATAAGAAATTC-AGGGG-CTAGGGACAATTTGT   {1438}
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Appendix G—continued.

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{                                            2310      2320      2330      2340      2350}
{                                               .         .         .         .         .}
Restrepiella_291            TAATA-------TTTTATTTTTTAGTTC-TT-TT-CATTGACAT------   {1834}
Pluer.racemiflora_140       TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1793}
Ponera.striata_197          TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1767}
Isochilis.major_279         TAATA-------TTTTATTTTTTAGTTC-TT-TT-CATTGACAT------   {1894}
Epi.ibaguense_60            TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1685}
Epi.conopseum_244           TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1612}
Nidema.boothii_192          TAATATTTAATATTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1663}
S._pulchella_W208           TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1648}
H.imbricata_283             TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1657}
Reichenbachanthus_W107      TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1608}
Hexadesmia_K336             TAATA-------TTTTCTTTTTTAGTTC-TT-TT-TATTGACAT------   {1657}
Acrorchis_399               TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGAC--------   {1642}
Jacquiniella_313            TAATA-------TTTTATTTTTTAGTTC-TT-TT-CATTGAC--------   {1653}
Hagsatera_229               TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1660}
Homalopetalum_234           TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1659}
Meiracyllium_trinas_129     TAATA-------TTTTCTTTTTTAGTTC-TT-TGTCGTTGACAT------   {1655}
Psy.mcconnelliae_W53R       TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1656}
Psy.krugii_62               TAATA-------TTTTCTTTTTTAGTTC-TT-TTTCATTGACAT------   {1659}
Brough.nigrilensis_152      TAATA-------TTTTCTTTTTTAGTTC-TTTT--CATTGACAT------   {1655}
Tetramica.elegans_160       TAATA-------TTTTCTTTTTTAGTTC-TTTT--CATTGACAT------   {1661}
Domingoa_225                TAATA-------TTTTCTTTTTTAGTTC-TTTT--CATTGACAT------   {1661}
Cattleyopsis_251            TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1673}
Brassav.cucullata_130       TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1656}
L.rubescens_W284            TAATA-------TCTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1651}
Myrmecophila_281            TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1642}
C.dowiana_282               TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1632}
Rhy.glauca_N134             TAATA-------TTTTCTTTTTTAGTTC-TTTT--CATTGACAT------   {1657}
C.forbesii_59               TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1601}
Soph.cernua_145             TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1663}
L.purpurata_84              TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1666}
Schm.splendida_280          TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1655}
E.citrina_54                TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1665}
E.mariae_56                 TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1641}
E.mariae_87                 TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1657}
D.polybulbon_61             TAATA-------TTTTCTTTTTAAGTTC-TT-TT-CATTGACAT------   {1596}
D.polybulbon_94             TAATA-------TTTTCTTTTTWAGTTC-TT-TT-CATTGACAT------   {1655}
E.adenocaula_12             TAATA-------TTTTCTTTTTTAGTTC-TTCTT-CATTGACAT------   {1622}
E.bractescens_21            TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1655}
E.aromatica_02              TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1658}
E.cordigera_24              TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1655}
E.tampensis_27              TAATA-------TTTTCTTTTTTAGTTCCTT-TT-CATTGACAT------   {1660}
E.tampensis_alba_23         TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1662}
E.dichroma_74               TAATA-------TTTTCTTTTTTA-TTC-TTTT--CATYGACAT------   {1640}
E.diurna_09                 TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1658}
E.asperula_65               TAATA-------TTTTCTTTTTTAGTTC-TTTT--CATTGACAT------   {1656}
E.candollei_29              TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1644}
E.randii_50                 TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1660}
E.kienastii_235             TAATA-------TTTTCTTTTTTAGTTC-TTTT--CATTGACAT------   {1650}
P.chimborazoensis_51        TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1646}
P.fragrans_172              TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1656}
P.aemula_17                 TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1647}
P.cochleata_31              TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1685}
P.pygmaea_81                TAATA-------TTTCCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1669}
P.pseudopygmaea_205         TAATA-------TTTTCTTTTTTAGTTC-TTTT--CATTGACAT------   {1669}
P.vitellina_57              TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1675}
P.glauca_176                TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACATCTTTTT   {1676}
P.ionocentra_46             TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1676}
P.prismatocarpa_19          TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1672}
P.ochracea_95               TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1642}
P.cretacea_230              TAATA-------TTTTCTTTTTTAGTTC-TTTT--CATTGACAT------   {1660}
E.luteorosea_178            TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1656}
E.luteorosea_173            TAATA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1656}
E.subulatifolia_128         TAATA-------TTTTCTTTTTTAGTTC-TTTT--CATTGACAT------   {1667}
E.subulatifolia_174         TAATA-------TTTTCTTTTTTAGTTCTTTT---CATTGACAT------   {1669}
E.cyanocolumna_1001         TAATA-------TTTTCTTTTTTAGTTC-TTTT--CATTGACAT------   {1664}
E.tenuissima_143            TACTA-------TTTTCTTTTTTAGTTC-TT-TT-CATTGACAT------   {1472}
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Appendix G—continued.

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{                                    2360      2370      2380      2390      2400}
{                                       .         .         .         .         .}
Restrepiella_291              -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1865}
Pluer.racemiflora_140         ---------AGATAGACATAGATATAAGTACTCTGCTAGGG---------   {1825}
Ponera.striata_197            -------------------AGATCTAAGTCCTCTGCTAGGATGATGCACG   {1798}
Isochilis.major_279           -------------------AGATATAAGTCCTCTGCTAGGATGATGCACG   {1925}
Epi.ibaguense_60              -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1716}
Epi.conopseum_244             -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1643}
Nidema.boothii_192            -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1694}
S._pulchella_W208             -------------------ATATATAAGTACTCTGCTAGGATGATGCACG   {1679}
H.imbricata_283               -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1688}
Reichenbachanthus_W107        -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1639}
Hexadesmia_K336               -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1688}
Acrorchis_399                 -------TTTCATTGACATAGATATAAGTACTCTGCTAGGATGATGCACA   {1685}
Jacquiniella_313              -------TTTCATTGACATAGATATAAGTACTCTGCTAGGATGATGCACA   {1696}
Hagsatera_229                 -------------------AGATATAATTACTCTGCTAGGATGATGCACG   {1691}
Homalopetalum_234             -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1690}
Meiracyllium_trinas_129       -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1686}
Psy.mcconnelliae_W53R         -------------------AGATATAAGTACTCTGTTAGGATGATGCACG   {1687}
Psy.krugii_62                 -------------------AGATATAAGTACTCTGTTAGGATGATGCACG   {1690}
Brough.nigrilensis_152        -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1686}
Tetramica.elegans_160         -------------------AGATAGAAGTACTCTGCTAGGATGATGCACG   {1692}
Domingoa_225                  -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1692}
Cattleyopsis_251              -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1704}
Brassav.cucullata_130         -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1687}
L.rubescens_w284              -------------------AGATATAAGTACTCTGCTAGGATGATGAACG   {1682}
Myrmecophila_281              -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1673}
C.dowiana_282                 -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1663}
Rhy.glauca_N134               -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1688}
C.forbesii_59                 -------------------AAATATAAGTACTCTGCTAGGATGATGCACG   {1632}
Soph.cernua_145               -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1694}
L.purpurata_84                -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1697}
Schm.splendida_280            -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1686}
E.citrina_54                  -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1696}
E.mariae_56                   -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1672}
E.mariae_87                   -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1688}
D.polybulbon_61               -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1627}
D.polybulbon_94               -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1686}
E.adenocaula_12               -------------------AGATATAAGTACTCTGATAGGATGATGCACG   {1653}
E.bractescens_21              -------------------AGATATAAGTACTCTGATAGGATGATGCACG   {1686}
E.aromatica_02                -------------------AGATATAAGTACTCTGATAGGATGATGCACG   {1689}
E.cordigera_24                -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1686}
E.tampensis_27                -------------------AGATATAAGTACTCTGATAGGATGATGCACG   {1691}
E.tampensis_alba_23           -------------------AGATATAAGTACTCTGATAGGATGATGCACG   {1693}
E.dichroma_74                 -------------------AGATATAAGTACTCTGATAGGATGATGCACG   {1671}
E.diurna_09                   -------------------AGATATAAGTACTCTGATAGGATGATGCACG   {1689}
E.asperula_65                 -------------------AGATATAAGTACTCTGATAGGATGATGCACG   {1687}
E.candollei_29                -------------------AGATATAAGTACTCTGATAGGATGATGCACG   {1675}
E.randii_50                   -------------------AGATATAAGTACTCTGATAGTATGATGCACG   {1691}
E.kienastii_235               -------------------AGATAGAAAGACTCTGCTAGGATGATGCACG   {1681}
P.chimborazoensis_51          -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1677}
P.fragrans_172                -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1687}
P.aemula_17                   -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1678}
P.cochleata_31                -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1716}
P.pygmaea_81                  -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1700}
P.pseudopygmaea_205           -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1700}
P.vitellina_57                -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1706}
P.glauca_176                  TAGTTCTTTTCATTGACATAGATATAAGTACTCTGCTAGGATGATGCACG   {1726}
P.ionocentra_46               -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1707}
P.prismatocarpa_19            -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1703}
P.ochracea_95                 -------------------AGATATAAGTACTCTGCTAGGATGATGCATG   {1673}
P.cretacea_230                -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1691}
E.luteorosea_178              -------------------AGATATAAGTACTCTGCTAAGATGATGCACG   {1687}
E.luteorosea_173              -------------------AGATATAAGTACTCTGCTAAGATGATGCACG   {1687}
E.subulatifolia_128           -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1698}
E.subulatifolia_174           -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1700}
E.cyanocolumna_1001           -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1695}
E.tenuissima_143              -------------------AGATATAAGTACTCTGCTAGGATGATGCACG   {1503}
```

Appendix G—continued.

{	2410 2420 2430 2440 2450}	
{	. . . . .}	
Restrepiella_291	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1905}
Pluer.racemiflora_140	GGAAATCGTCGGGATAGCTCAGT-GGG--T--AG-AGCA-GAG--GA-CT	{1865}
Ponera.striata_197	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1838}
Isochilis.major_279	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1965}
Epi.ibaguense_60	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1756}
Epi.conopseum_244	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1683}
Nidema.boothii_192	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1734}
S._pulchella_W208	GAAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1719}
H.imbricata_283	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1728}
Reichenbachanthus_W107	GGAAATCGTCGGGA-AGCTCAG---------------------------	{1660}
Hexadesmia_K336	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AA-AGCA-AAG--GA-CT	{1728}
Acrorchis_399	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1725}
Jacquiniella_313	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-AAG--GA-CT	{1736}
Hagsatera_229	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1731}
Homalopetalum_234	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1730}
Meiracyllium_trinas_129	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1726}
Psy.mcconnelliae_W53R	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1727}
Psy.krugii_62	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1730}
Brough.nigrilensis_152	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1726}
Tetramica.elegans_160	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1732}
Domingoa_225	GGCAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1732}
Cattleyopsis_251	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1744}
Brassav.cucullata_130	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1727}
L.rubescens_w284	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1722}
Myrmecophila_281	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1713}
C.dowiana_282	AGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1703}
Rhy.glauca_N134	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-CA---GG-CT	{1727}
C.forbesii_59	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1672}
Soph.cernua_145	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AA-AGCA-AAG--GA-CT	{1734}
L.purpurata_84	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1737}
Schm.splendida_280	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1726}
E.citrina_54	GGAAATCGTCGGGATAGCTCAGT-TGGCGT--AGCAGCA-GAAA-GAACT	{1741}
E.mariae_56	GGAAATCGTCGGGATAGCTCAGT-TGG-CT--AG-AGCA-GAG--GA-CT	{1713}
E.mariae_87	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1728}
D.polybulbon_61	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AA-AGCA-GAG--GA-CT	{1667}
D.polybulbon_94	GGAAATCGTCGGGATAGCTCAGTGTGG--T--AG-AGCA-GAG--GA-CT	{1727}
E.adenocaula_12	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1693}
E.bractescens_21	GGAAATCGTCGGGATAGCTCAGT-TGG--TTCAG-AGCA-GAG--GA-CT	{1728}
E.aromatica_02	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1729}
E.cordigera_24	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AA-AGCA-GAG--GA-CT	{1726}
E.tampensis_27	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1731}
E.tampensis_alba_23	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1733}
E.dichroma_74	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-G-G--GA-CT	{1710}
E.diurna_09	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCAAGAG--GA-CT	{1730}
E.asperula_65	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1727}
E.candollei_29	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1715}
E.randii_50	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1731}
E.kienastii_235	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1721}
P.chimborazoensis_51	GAAAATCGTCGGGATAGCTCAGT-TGG--T--AA-AGCA-GAG--GA-CT	{1717}
P.fragrans_172	GAAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1727}
P.aemula_17	GAAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1718}
P.cochleata_31	GGAAATCGTCGGGATAGCTCAGT-TGG--T-CAG-AGCA-GAG--GA-CT	{1757}
P.pygmaea_81	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1740}
P.pseudopygmaea_205	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1740}
P.vitellina_57	GGAAATCGTCGGGATAGCTCAGT-TGG--T-C-G-AGCA-GAG--GA-CT	{1746}
P.glauca_176	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1766}
P.ionocentra_46	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1747}
P.prismatocarpa_19	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1743}
P.ochracea_95	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1713}
P.cretacea_230	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1731}
E.luteorosea_178	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1727}
E.luteorosea_173	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1727}
E.subulatifolia_128	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1738}
E.subulatifolia_174	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1740}
E.cyanocolumna_1001	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAAG-GA-CT	{1736}
E.tenuissima_143	GGAAATCGTCGGGATAGCTCAGT-TGG--T--AG-AGCA-GAG--GA-CT	{1543}

Appendix G—continued.

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                                                                    |<-matK Start
{                                        2460      2470      2480      2490      2500}
{                                           .         .         .         .         .}
Restrepiella_291               GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAAA-----?----   {1936}
Pluer.racemiflora_140          GAAAA--TCCTC---GGGT---CCCCAG-TTC-AAATA????????----   {1901}
Ponera.striata_197             GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATA-------?----   {1867}
Isochilis.major_279            GAAAA--TCCTC---GTGT---CACCAG-TTC-AAATAC???????----   {2001}
Epi.ibaguense_60               GAAAA--TCCTC---GTGT---CACCAG-TTC-AAATA-------?----   {1785}
Epi.conopseum_244              GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAAA?----?----   {1715}
Nidema.boothii_192             GAAAA--TCCTC---GTGT---CAC-A-GTTCAAAATAA------?----   {1764}
S._pulchella_W208              GAAAA--TCCTC---GTGT---CAC-AGGTCC-AAATA-------?----   {1748}
H.imbricata_283                GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATA????????----   {1764}
Reichenbachanthus_W107         ---------------------------------------------?----   {1661}
Hexadesmia_K336                GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAA------?----   {1758}
Acrorchis_399                  GAAAA--TCCTC---GTTT---CACCA-TTTC-AAATAA------?----   {1755}
Jacquiniella_313               GAAAA--TCCTC---GTGT---CCCCA-GTTC-AAATA-------?----   {1765}
Hagsatera_229                  GAAAA--TCCTC---GTGT---CACCA-GTTCAAAATAA------?----   {1762}
Homalopetalum_234              GAAAA--TCCTC---GTGT---C-CCA-GTACAAAAA--------?----   {1758}
Meiracyllium_trinas_129        GAAAA--TCCTC---GTGT---CAC-AGGTCC-AAATA-------?----   {1755}
Psy.mcconnelliae_W53R          GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAA------?----   {1757}
Psy.krugii_62                  GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATA-------?----   {1759}
Brough.nigrilensis_152         GAAAA--TCCTC---GTGT---CACCA-GTTC--AATAA------?----   {1755}
Tetramica.elegans_160          GAAAA--TCCTC---GTTT---C-CCA-GTTC-AAATAAA-----?----   {1762}
Domingoa_225                   GAAAA--TCCTC---GTGT---C-CCA-GTTC-AAATAAA-----?----   {1762}
Cattleyopsis_251               GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATTAA-----?----   {1775}
Brassav.cucullata_130          GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAA------?----   {1757}
L.rubescens_w284               GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAA------?----   {1752}
Myrmecophila_281               GAATA----------------------------------------?----   {1719}
C.dowiana_282                  GATA-----------------------------------------?----   {1708}
Rhy.glauca_N134                GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAACA----?----   {1759}
C.forbesii_59                  GAA------------------------------------------?----   {1676}
Soph.cernua_145                GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAA------?----   {1764}
L.purpurata_84                 GAAAA--TCTCTCTCGTGT---CACCA-GTTC-AAATA-------?----   {1769}
Schm.splendida_280             GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAAA-----?----   {1757}
E.citrina_54                   GAAAAAATCCTCC--GTGTT--CACCAAGTTCCAAA-A-ATCTCT?----   {1781}
E.mariae_56                    GAAAA--TCCTCC--GTGT---CACCACGTTCCAAATACATCTCT?----   {1752}
E.mariae_87                    GAAAA--TCCTC---GTGT---CACC-AGTTC-AAATATTT----?----   {1760}
D.polybulbon_61                GAAA-TATCCTC---GTGT---CACCA-GTTC-AA-TA-------?----   {1696}
D.polybulbon_94                GAAA-TATCCTC---GTGT---CACCA-GTTC-AA-TA-------?----   {1756}
E.adenocaula_12                GAAAA--TCCTC---GTGT---CACCA-GTTC--AATA-------?----   {1721}
E.bractescens_21               GAAAA--TCCTC---GTGT-----CCAAGTTC-AAATC-------?----   {1756}
E.aromatica_02                 GAAAA--TCCTC---GTGT---CACCA-TTTC-AAATA-------?----   {1758}
E.cordigera_24                 GAAA--TTCTTC---GTGT---CACCA-GTTC-AA-TAA------?AAAG   {1759}
E.tampensis_27                 GAAA--TTCTTC---TTTT---CCCCA-TTTC-AA-TA-------?----   {1759}
E.tampensis_alba_23            GAAA--TTCTTC---TTTT---CCCCA-TTTC-AAATA-------?----   {1762}
E.dichroma_74                  GAA-TA---------------------------------------?----   {1716}
E.diurna_09                    GAAA--TTCTTC---TTTT---CCCCA-TTTC-AA-TA-------?----   {1758}
E.asperula_65                  GAAAA--TCCTCTT-GT-----CACCA-GTTC-AAATA-------?----   {1756}
E.candollei_29                 GAAAA--TCCTC---TTTT---CACCA-GTTC-AAATAA------?----   {1745}
E.randii_50                    GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATTAA-----?----   {1762}
E.kienastii_235                GAAA---TCCTC---GTGT---CTCCA-GTTC-AAATAAAAAA--?----   {1754}
P.chimborazoensis_51           GAAAA--TCCTC---GTTT---CACCA-TTTC-AAAAA-------?----   {1746}
P.fragrans_172                 GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATA-------?----   {1756}
P.aemula_17                    GAAAA--TCCTC---GTTT---CACCA-TTTC-AAATAA------?----   {1748}
P.cochleata_31                 GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATA-------?----   {1786}
P.pygmaea_81                   GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAA------?----   {1770}
P.pseudopygmaea_205            GAAAA--TCCTC---GTGT---C-CCA-GTTC--AATAA------?----   {1768}
P.vitellina_57                 GTCATAATCCTC---GTGT---CACCA-GTTC-AAATA-------?----   {1777}
P.glauca_176                   GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAAA-----?----   {1797}
P.ionocentra_46                GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATCA------?----   {1777}
P.prismatocarpa_19             GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATA-------?----   {1772}
P.ochracea_95                  GAAA--TTCCTC---GTGTT--CACCA-GTTC-AA-TGA------?----   {1743}
P.cretacea_220                 GAAAA--TCCTC---GTGT---CACCA-GTTC--AATTAA-----?----   {1761}
E.luteorosea_178               GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAAA-----?----   {1758}
E.luteorosea_173               GAAAC----------------------------------------?----   {1733}
E.subulatifolia_128            GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAA------?----   {1768}
E.subulatifolia_174            GAAAA--TCCTC---GTGT---CACCA-GTTC-AAATAAA-----?----   {1771}
E.cyanocolumna_1001            G--------------------------------------------?----   {1738}
E.tenuissima_143               GAA-TAAT-------------------------------------?----   {1551}
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Appendix G—continued.

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{                                          2510      2520      2530      2540      2550}
{                                             .         .         .         .         .}
Restrepiella_291              --------------------------------CTTTTATCCGGCTACTCC   {1954}
Pluer.racemiflora_140         ---------------------------GTACT?CTTCTAACCGGTACTCC   {1924}
Ponera.striata_197            ---------------------------ACT?CTTTTATCCGGTACTC?TT   {1890}
Isochilis.major_279           --------------------------------TAATCCGGGTACTCC?TT   {2019}
Epi.ibaguense_60              ----------------GCAAGAAAATTTCCTTCAATACGGTAATTCCGTT   {1819}
Epi.conopseum_244             -----------------------------------TATCCGGCAACTCCT   {1730}
Nidema.boothii_192            --------------------------------------------------   {1764}
S._pulchella_W208             ---------------------ACTTCCTTTTTATCCGGG??ACTCCT?TC   {1777}
H.imbricata_283               -------------------TTATTC?GGTTAACTTCCT?TCCAGGGAAAT   {1795}
Reichenbachanthus_W107        --------------------------------------ATCCGGGTACTC   {1673}
Hexadesmia_K336               ----------------------------------ACTTCTTATCGTTACT   {1774}
Acrorchis_399                 ------------------------ACCTTCCTTCTTATCCGGCTACTCTT   {1781}
Jacquiniella_313              --------------------------GAAACT?CTTTTATCCGGCTACTC   {1789}
Hagsatera_229                 -----------ATATTTCGGCAACAAAACTTCCTATATCCGCTACTCTTT   {1801}
Homalopetalum_234             --------------------------------------------------   {1758}
Meiracyllium_trinas_129       -------------------------------TAGATACGGTACTACGGTG   {1774}
Psy.mcconnelliae_W53R         --------------------------------------------------   {1757}
Psy.krugii_62                 --------------------------------------------------   {1759}
Brough.nigrilensis_152        --------------------------------------------------   {1755}
Tetramica.elegans_160         -----------AAGTTTTCGGCAACAAAACTTCCTATATCCGCTACTCTT   {1801}
Domingoa_225                  --------------------------------------------------   {1762}
Cattleyopsis_251              --------------------------------------------------   {1775}
Brassav.cucullata_130         ----------------------AATTTACCTTAAATACGGTACTACGGTG   {1785}
L.rubescens_w284              -------------------------------CTTTTATCCGGCTACTCCT   {1771}
Myrmecophila_281              --------AGATAGATTTCGGCAACAAAACTTCCTATATCCGCTACTCTT   {1761}
C.dowiana_282                 -------------------------------------------TACTCTT   {1715}
Rhy.glauca_N134               --------------------------------TTTTATCCGGTACTCCTT   {1777}
C.forbesii_59                 --------------------------------------------------   {1676}
Soph.cernua_145               --------------------------------------------------   {1764}
L.purpurata_84                ------------------------------------TTTTATCCGTACTC   {1783}
Schm.splendida_280            -----------------------------CTTTTATCCGGCTACTCC?TT   {1778}
E.citrina_54                  --------------------------------------------------   {1781}
E.mariae_56                   -----------AGAGATTCGGCAACAAAACTTCCTATATCCGTTACTCTT   {1791}
E.mariae_87                   ------------------------GAGAACTTCCTCTATCCGTTACTCTT   {1786}
D.polybulbon_61               ---TAATTAAGATAGATTCGGCWWCAAAACTTCCTATATCCGCTACTCTT   {1743}
D.polybulbon_94               ------------------------------CTTCAATCTGTTATTCGTTT   {1776}
E.adenocaula_12               -------------------------------GACTTGATTGGATTGAGCC   {1740}
E.bractescens_21              -----------------------------------CAATCCGTAATCCGT   {1771}
E.aromatica_02                -----------AGWAGATTCGGCAACAAAATTCCTATATCCGTGACTCTT   {1797}
E.cordigera_24                AATAGGATTTCGGGCCAACAAAAATTTTTCCCTAAAATCCGGTTACTCTT   {1809}
E.tampensis_27                ------------------------------------------TTACTCTT   {1767}
E.tampensis_alba_23           --------------------------------CCTATATCCGTTACTCTT   {1780}
E.dichroma_74                 --------------------------------------------------   {1716}
E.diurna_09                   ---------------TGGCCGCTACAGAATCTCCTATATCCGTTACTCTT   {1793}
E.asperula_65                 ------------AAGATTCGGCAACAAAATTTCCTATATCCGTTACTCTT   {1794}
E.candollei_29                --------------------------------------------------   {1745}
E.randii_50                   ------------------------------------------TWACTCTT   {1770}
E.kienastii_235               -----------ATAGATTTGGCAACAAAACTTCCTATATCCGTTACTCTT   {1793}
P.chimborazoensis_51          ------------------------------------------AATACGTC   {1754}
P.fragrans_172                ---------------------------ACATMCGCWCATCTGTAATCGTC   {1779}
P.aemula_17                   -----------TAGATTTCGGCAACAAAACTTCCTATATCCGCTACTCTT   {1787}
P.cochleata_31                ----------------------GCAAAATCCCTTCAATCCGTAATCCGTT   {1814}
P.pygmaea_81                  ----------------------------------TATATCCGGTACTCGT   {1786}
P.pseudopygmaea_205           ---------------------------------CTATATCCGGTACTCCT   {1785}
P.vitellina_57                -----------------------TTTCCTTCAATACGGTAATTCCGTTCA   {1804}
P.glauca_176                  -----------TAGATTTCGGCAACAAAACTTCCTATATCCGCTACTCTT   {1836}
P.ionocentra_46               ---------------------------TATCCTACGATCTCGAATACGTC   {1800}
P.prismatocarpa_19            --------------------------------------------------   {1772}
P.ochracea_95                 --------------------------------------------------   {1743}
P.cretacea_230                ------------------------------CTGATATCCGGCTACTCCTT   {1781}
E.luteorosea_178              --------------------------------------------------   {1758}
E.luteorosea_173              ------------------------------ACTTCCTCTATCCGCTACTC   {1753}
E.subulatifolia_128           ------------------------------------------TACTCCTT   {1776}
E.subulatifolia_174           AGGATATTAGATAGATCTTGGCAACAAAACTTCCTCTATCCGCTACTCCT   {1821}
E.cyanocolumna_1001           --AAAAAAGATAGATTCCGGCAACAAAACTTCCTATATCCGCTACTCCTT   {1786}
E.tenuissima_143              ----------------------------------CAATCCGTAATCCGTA   {1567}
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Appendix G—continued.

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{                                          2560      2570      2580      2590      2600}
{                                             .         .         .         .         .}
Restrepiella_291              TTCAGAGTATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {2004}
Pluer.racemiflora_140         TTCAGGAGATATTAACTCACT-GCTCATTATCATAGCTTCAATAGTTTGA   {1973}
Ponera.striata_197            CGGGAGTATTATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1940}
Isochilis.major_279           CCGGGAGTATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {2069}
Epi.ibaguense_60              CAGGAAGATATATTACTCACTTGCTCATTATCATAACTTCAATAGTTTGA   {1869}
Epi.conopseum_244             TCAGGAATATATTTACTCACTTGCTCATTATCATAACTTCAATAGTTTGA   {1780}
Nidema.boothii_192            ---CAGGATATTTTACTCACTTGCTCATTATCATAGCTTCAATAGTTKGA   {1811}
S._pulchella_W208             AGGGAATAATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1827}
H.imbricata_283               ACTATTTTAGCTACACT?GGCTCAATTAATCAAGAGCTTCAATAGTTTGA   {1845}
Reichenbachanthus_W107        TTCAGGATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1723}
Hexadesmia_K336               CTCAGGATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1824}
Acrorchis_399                 TCARGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTTA   {1831}
Jacquiniella_313              CTTCAGATATATTTACTCACTTGCTCATTATCATAGCTACAATAGTTTGA   {1839}
Hagsatera_229                 CAGGAAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1851}
Homalopetalum_234             --CAGGATATATTTA-TCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1805}
Meiracyllium_trinas_129       CAGGAAGATATAYTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1824}
Psy.mcconnelliae_W53R         --------------ACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1793}
Psy.krugii_62                 ------GATATTTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1803}
Brough.nigrilensis_152        ----AGATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1801}
Tetramica.elegans_160         TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1851}
Domingoa_225                  ---CAGGTATATTTACTCACTTTCTCATTATCATAGCTTCAATAGTTTCA   {1809}
Cattleyopsis_251              --------ATATTTACTCACTTGCTC-TTATCATAGCTTCA-TAGTTTGA   {1815}
Brassav.cucullata_130         CAGGAAGATATATTACTCACTTGCTCATGATCATAGCTTCAATAGTTTGA   {1835}
L.rubescens_w284              TCAGGAATATATTTACTCACTTGCTCATTATCATAACTTCAATAGTTTGA   {1821}
Myrmecophila_281              TCAGGAATATATTTACTCACTTGCTCATTATCATAACTTCAATAGTTTGA   {1811}
C.dowiana_282                 TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTAA   {1765}
Rhy.glauca_N134               CCAGGAATAAATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1827}
C.forbesii_59                 ----------------------GCTCATTATCATAGCTTCAATAGTTTGA   {1704}
Soph.cernua_145               TTACGTCTCTCGGAAATACCCTGCTCATTATCATAGCTTCAATAGTTTGA   {1814}
L.purpurata_84                CTTCAGATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1833}
Schm.splendida_280            CAGGGAATATATTTACTCACTTGCTCATTATCATAACTTCAATAGTTTGA   {1828}
E.citrina_54                  ----CATGATATATTATCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1827}
E.mariae_56                   TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1841}
E.mariae_87                   CCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1836}
D.polybulbon_61               TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1793}
D.polybulbon_94               CGGGAAGATACTTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1826}
E.adenocaula_12               TCGGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1790}
E.bractescens_21              TCAGGGATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1821}
E.aromatica_02                TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1847}
E.cordigera_24                TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1859}
E.tampensis_27                TCAKGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1817}
E.tampensis_alba_23           TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1830}
E.dichroma_74                 --AAGAGTATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1764}
E.diurna_09                   TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1843}
E.asperula_65                 TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1844}
E.candollei_29                ---------------------TGCTCTTTATCATAGCTTCAATAGTTTGA   {1774}
E.randii_50                   TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1820}
E.kienastii_235               TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1843}
P.chimborazoensis_51          AGGGAGAAACTTAACTACACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1804}
P.fragrans_172                AGGGAGAAACTTTACTACACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1829}
P.aemula_17                   TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1837}
P.cochleata_31                CAGGGATATATTCACTGCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1864}
P.pygmaea_81                  TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTTA   {1836}
P.pseudopygmaea_205           TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTTA   {1835}
P.vitellina_57                GGACATGATATATTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1854}
P.glauca_176                  TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCGATAGTTTGA   {1886}
P.ionocentra_46               AGGGAGAAACTTAACTACACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1850}
P.prismatocarpa_19            ----------------------GCTCATTATCATAGCTTCAATAGTTTGA   {1800}
P.ochracea_95                 ------GATATTTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1787}
P.cretacea_230                CAGGAATATATTTACCTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1831}
E.luteorosea_178              --CGCAGTATATTTACTCACTTGCTCATTATCATAGTTTCAATAGTTTGA   {1806}
E.luteorosea_173              CTTCAGATATATTTACTCACTTGCTCATTATCATAGTTTCAATAGTTTGA   {1803}
E.subulatifolia_128           CAGGAGTATATTTATTCACTTGCGTCATTATCATAGCTTCAATAGTTTGA   {1826}
E.subulatifolia_174           TCAGGAGTATATTTATTCACTTGCTCATTATCATAGCTTCGATAGTTTGA   {1871}
E.cyanocolumna_1001           TCAGGAATATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1836}
E.tenuissima_143              GCAGGGAGATATTTACTCACTTGCTCATTATCATAGCTTCAATAGTTTGA   {1617}
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Appendix G—continued.

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{                                           2610        2620        2630        2640        2650}
{                                              .           .           .           .           .}
Restrepiella_291              TTTTTTACGAACCTGTGGAAATTATTGGTTATGACAAGAAATCTAGTTTA    {2054}
Pluer.racemiflora_140         TTTTTTACGAACCTGTGGAAATTATTGGTTATGACAATAAATCTAGTTTA    {2023}
Ponera.striata_197            TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1990}
Isochilis.major_279           TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {2119}
Epi.ibaguense_60              TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1919}
Epi.conopseum_244             TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1830}
Nidema.boothii_192            TTTTTTATGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1861}
S._pulchella_W208             TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1877}
H.imbricata_283               TTTTTTACGAAGCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1895}
Reichenbachanthus_W107        TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1773}
Hexadesmia_K336               TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1874}
Acrorchis_399                 TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1881}
Jacquiniella_313              TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1889}
Hagsatera_229                 TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1901}
Homalopetalum_234             TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1855}
Meiracyllium_trinas_129       TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1874}
Psy.mcconnelliae_W53R         TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTC    {1843}
Psy.krugii_62                 TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTC    {1853}
Brough.nigrilensis_152        TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1851}
Tetramica.elegans_160         TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAAGAAATCTAGTTTA    {1901}
Domingoa_225                  TTTTTTACGAACCTGTAGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1859}
Cattleyopsis_251              TTTTTTACGAACCTGTGGAAATTATCGGTTATGATAATAAATCTAGTTTA    {1865}
Brassav.cucullata_130         TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1885}
L.rubescens_w284              TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1871}
Myrmecophila_281              TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1861}
C.dowiana_282                 TTTTTTACGAACCTGTGGAAATTATTGGTTATGACAATAAATCTAGTTTA    {1815}
Rhy.glauca_N134               TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1877}
C.forbesii_59                 TTTTTTACGAACCTGTGGAAATTATTGGTTATGACAATAAATCTAGTTTA    {1754}
Soph.cernua_145               TTTTTTACGAACCTGTGGAAATTATTGGTTATGACAATAAATCTAGTTTA    {1864}
L.purpurata_84                TTTTTTACGAACCTGTGGAAATTATTGGTTATGACAATAAATCTAGTTTA    {1883}
Schm.splendida_280            TTTTTTACGAACCTGTGGAAATGATCGGTTATGACAATAAATCTAGTTTA    {1878}
E.citrina_54                  TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1877}
E.mariae_56                   TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1891}
E.mariae_87                   TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAATTCTAGTTTA    {1886}
D.polybulbon_61               TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTCTA    {1843}
D.polybulbon_94               TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1876}
E.adenocaula_12               TTTTTTACGAACCTGTGGAAATCATCGGTTATGACAATAAATCTAGTTTA    {1840}
E.bractescens_21              TTTTTTACGAACCTGTGGAAATAATCGGTTATGACAATAAATCTAGTTTA    {1871}
E.aromatica_02                TTTTTTACGAACCTGTGGAAATCATCGGTTATGACAATAAATCTAGTTTA    {1897}
E.cordigera_24                TTTTTTACGAACCTGTGGAAATCATCGGTTATGACAATAAATCTAGTTTA    {1909}
E.tampensis_27                TTTTTTACGAACCTGTGGAAATCATCGGTTATGACAATAAATCTAGTTTA    {1867}
E.tampensis_alba_23           TTTTTTACGAACCTGTGGAAATCATCGGTTATGACAATAAATCTAGTTTA    {1880}
E.dichroma_74                 TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1814}
E.diurna_09                   TTTTTTACGAACCTGTGGAAATCATCGGTTATGACAATAAATCTAGTTTA    {1893}
E.asperula_65                 TTTTTTACGAACCTGTGGAAATCATCGGTTATGACAATAAATCTAGTTTA    {1894}
E.candollei_29                TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1824}
E.randii_50                   TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1870}
E.kienastii_235               TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1893}
P.chimborazoensis_51          TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1854}
P.fragrans_172                TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1879}
P.aemula_17                   TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1887}
P.cochleata_31                TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1914}
P.pygmaea_81                  TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1886}
P.pseudopygmaea_205           TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1885}
P.vitellina_57                TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1904}
P.glauca_176                  TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1936}
P.ionocentra_46               TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1900}
P.prismatocarpa_19            TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1850}
P.ochracea_95                 TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1837}
P.cretacea_230                TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1881}
E.luteorosea_178              TTTTTTACGAACCTGTGGAAATTATTGGTTATGACAATAAATCTAGTTTA    {1856}
E.luteorosea_173              TTTTTTACGAACCTGTGGAAATTATTGGTTATGACAATAAATCTAGTTTA    {1853}
E.subulatifolia_128           TTTTTTACGAACCTGTGGAAATTATCGGTTATGACAATAAATCTAGTTTA    {1876}
E.subulatifolia_174           TTTTTTATGAACCTGTGGAATTTATCGGTTATGACAATAAATCTAGTTTA    {1921}
E.cyanocolumna_1001           TTTTTTACGAACCTGTGGAAATTATTGGTTATGACAATAAATCTAGTTTA    {1886}
E.tenuissima_143              TTTTTTACGAACCTGTGGAAATTATTGGTTATGACAATAAATCTAGTTTA    {1667}
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Appendix G—continued.

{	2660 2670 2680 2690 2700}	
{	. . . . .}	
Restrepiella_291	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{2102}
Pluer.racemiflora_140	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{2071}
Ponera.striata_197	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{2038}
Isochilis.major_279	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{2167}
Epi.ibaguense_60	GTACTTGTGAAACGCTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1967}
Epi.conopseum_244	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1878}
Nidema.boothii_192	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1909}
S._pulchella_W208	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1925}
H.imbricata_283	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1943}
Reichenbachanthus_W107	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1821}
Hexadesmia_K336	GTACTTGTGAAACGTTTAATTATTCGAATGTATCAACAGAAATCTTTG--	{1922}
Acrorchis_399	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1929}
Jacquiniella_313	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1937}
Hagsatera_229	GTACTTGTAAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1949}
Homalopetalum_234	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1903}
Meiracyllium_trinas_129	GTACTTGTGAAACGCTTAATTATTCGAATGTATCAACAGAAATCTTTG--	{1922}
Psy.mcconnelliae_W53R	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1891}
Psy.krugii_62	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1901}
Brough.nigrilensis_152	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1899}
Tetramica.elegans_160	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1949}
Domingoa_225	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1907}
Cattleyopsis_251	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1913}
Brassav.cucullata_130	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1933}
L.rubescens_w284	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1919}
Myrmecophila_281	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAACCTTTG--	{1909}
C.dowiana_282	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1863}
Rhy.glauca_N134	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1925}
C.forbesii_59	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1802}
Soph.cernua_145	GTACTTGTAAAACATTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1912}
L.purpurata_84	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1931}
Schm.splendida_280	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1926}
E.citrina_54	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1925}
E.mariae_56	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1939}
E.mariae_87	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1934}
D.polybulbon_61	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1891}
D.polybulbon_94	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1924}
E.adenocaula_12	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1888}
E.bractescens_21	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1919}
E.aromatica_02	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTTAT	{1947}
E.cordigera_24	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1957}
E.tampensis_27	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1915}
E.tampensis_alba_23	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1928}
E.dichroma_74	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTT--	{1862}
E.diurna_09	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1941}
E.asperula_65	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1942}
E.candollei_29	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1872}
E.randii_50	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1918}
E.kienastii_235	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1941}
P.chimborazoensis_51	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1902}
P.fragrans_172	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1927}
P.aemula_17	GTACTTGTTAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1935}
P.cochleata_31	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1962}
P.pygmaea_81	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1934}
P.pseudopygmaea_205	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1933}
P.vitellina_57	GTACTTGTGAAACGTTTAAGTACTCGAATGTATCAACAGAAATCTTTG--	{1952}
P.glauca_176	GTACTTGTGAAACGTTTAAGTACTCGAATGTATCAACAGAAATCTTTG--	{1984}
P.ionocentra_46	GTACTTGTGAAACGTTTAAGTACTCGAATGTATAAACAGAAATCTTTG--	{1948}
P.prismatocarpa_19	GTACTTGTGAAACGTTTAAGTACTCGAATGTATAAACAGAAATCTTTG--	{1898}
P.ochracea_95	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1885}
P.cretacea_230	GTACTTGTGAAACGTTTAAGTACTCGAATGTATCAACAGAAATCTTTG--	{1929}
E.luteorosea_178	GTGCTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1904}
E.luteorosea_173	GTGCTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1901}
E.subulatifolia_128	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1924}
E.subulatifolia_174	GTACTTGTGAAACGTTTAATTAWTCGAATGTATCAACAGAAATCTTTG--	{1969}
E.cyanocolumna_1001	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1934}
E.tenuissima_143	GTACTTGTGAAACGTTTAATTACTCGAATGTATCAACAGAAATCTTTG--	{1715}

Appendix G—continued.

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{                                             2710      2720      2730      2740      2750}
{                                                .         .         .         .         .}
Restrepiella_291                  ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {2142}
Pluer.racemiflora_140             ----------ATTTCTTCGTTGAATGATTCTAACCAAAATGGATTTTGGG    {2111}
Ponera.striata_197                ----------ATTTCTTCGTTGAATGATTCTAACCAAAATGGATTTTGGG    {2078}
Isochilis.major_279               ----------ATTTCTTCGTTGAATGATTCTAACCAAAATGAATTTTGGG    {2207}
Epi.ibaguense_60                  ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGTG    {2007}
Epi.conopseum_244                 ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1918}
Nidema.boothii_192                ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1949}
S._pulchella_W208                 ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTTGG    {1965}
H.imbricata_283                   ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1983}
Reichenbachanthus_W107            ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1861}
Hexadesmia_K336                   ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1962}
Acrorchis_399                     ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1969}
Jacquiniella_313                  ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGGATTTTGGG    {1977}
Hagsatera_229                     ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1989}
Homalopetalum_234                 ----------ATTTCTTCGGTGAATGATTCTAGTCAAAATGAATTTTGGG    {1943}
Meiracyllium_trinas_129           ----------ATTTATTCGTTTAATGATTCTAACCAAAATTCATTTTGGG    {1962}
Psy.mcconnelliae_W53R             ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1931}
Psy.krugii_62                     ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1941}
Brough.nigrilensis_152            ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1939}
Tetramica.elegans_160             ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1989}
Domingoa_225                      ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGGATTTTGGG    {1947}
Cattleyopsis_251                  ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1953}
Brassav.cucullata_130             ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATCTTGGG    {1973}
L.rubescens_w284                  ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1959}
Myrmecophila_281                  ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1949}
C.dowiana_282                     ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATCTTGGG    {1903}
Rhy.glauca_N134                   ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATCTTGGG    {1965}
C.forbesii_59                     ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATCTTGGG    {1842}
Soph.cernua_145                   ----------ATTTCTTCGGTGAATTATTCTAACCAAAATGAATATTGGG    {1952}
L.purpurata_84                    ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATCTTGGG    {1971}
Schm.splendida_280                ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1966}
E.citrina_54                      ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1965}
E.mariae_56                       ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1979}
E.mariae_87                       ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1974}
D.polybulbon_61                   ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1931}
D.polybulbon_94                   ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1964}
E.adenocaula_12                   ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1928}
E.bractescens_21                  ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1959}
E.aromatica_02                    TTCTTCTTTTATTTCTTCGGTGAATGATTCTAACCAAAATGGATTTTGGG    {1997}
E.cordigera_24                    ----------ATTTCTTCGGTGAATGATTCTAACAAAAATGAATTTTGGG    {1997}
E.tampensis_27                    ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGGATTTTGGG    {1955}
E.tampensis_alba_23               ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGGATTTTGGG    {1968}
E.dichroma_74                     ----------ATTTATTCGGTGAATGATTCTAACCAAAATTCATTTTGGG    {1902}
E.diurna_09                       ----------ATTTCTTCGGTGAATAATTCTAACCAAAATGAATTTTGGG    {1981}
E.asperula_65                     ----------ATTTCTTCGGTGAATGATTCTAACAAAAATGAATTTTGGG    {1982}
E.candollei_29                    ----------ATTTATTCGGTGAATGATTCTAACCAAAATTCATTTTGGG    {1912}
E.randii_50                       ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1958}
E.kienastii_235                   ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1981}
P.chimborazoensis_51              ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAAATTTGGG    {1942}
P.fragrans_172                    ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1967}
P.aemula_17                       ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1975}
P.cochleata_31                    ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {2002}
P.pygmaea_81                      ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1974}
P.pseudopygmaea_205               ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1973}
P.vitellina_57                    ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1992}
P.glauca_176                      ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {2024}
P.ionocentra_46                   ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1988}
P.prismatocarpa_19                ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1938}
P.ochracea_95                     ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1925}
P.cretacea_230                    ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1969}
E.luteorosea_178                  ----------ATTTCTTCGGTGAATGATTCTAACAAAAATGAATTTTGGG    {1944}
E.luteorosea_173                  ----------ATTTCTTCGGTGAATGATTCTAACAAAAATGAATTTTGGG    {1941}
E.subulatifolia_128               ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGAATTTTGGG    {1964}
E.subulatifolia_174               ----------ATTTCTTCGGTGAATGATTCTAACCAAAATGARTTTTGGG    {2009}
E.cyanocolumna_1001               ----------ATTTCTTCGGTGAATGATTCTAACAAAAATGGATTTTGGG    {1974}
E.tenuissima_143                  ----------ATTTCTTCGGTGAATGATTCTAACAAAAATGGATTTTGGG    {1755}
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Appendix G—continued.

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{                                             2760      2770      2780      2790      2800}
{                                                .         .         .         .         .}
Restrepiella_291            GGCACAAAAATTCTTTTTCTTCTCATTTTTATTCTCAAATGGTATCAGAA    {2192}
Pluer.racemiflora_140       AGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2161}
Ponera.striata_197          GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2128}
Isochilis.major_279         GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2257}
Epi.ibaguense_60            GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2057}
Epi.conopseum_244           GGAACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1968}
Nidema.boothii_192          GGCACAAAAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1999}
S._pulchella_W208           GGCACAAGAATACTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2015}
H.imbricata_283             GGCACAAGAATACTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2033}
Reichenbachanthus_W107      GGCACAAGAATACTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1911}
Hexadesmia_K336             GGCACAAGAATACTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2012}
Acrorchis_399               GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2019}
Jacquiniella_313            GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGCTATCAGAA    {2027}
Hagsatera_229               GGCACAAGAATTCTTTTGCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2039}
Homalopetalum_234           GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTAAAATGGTATCAGAA    {1993}
Meiracyllium_trinas_129     GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2012}
Psy.mcconnelliae_W53R       GGCACAAGAATTCTTTTTCTTCTCATTTTTTTTCTCAAATGGTATCAGAA    {1981}
Psy.krugii_62               GGCACAAGAATTCTTTTTCTTCTCATTTTTTTTCTCAAATGGTATCAGAA    {1991}
Brough.nigrilensis_152      GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1989}
Tetramica.elegans_160       GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2039}
Domingoa_225                GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1997}
Cattleyopsis_251            GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2003}
Brassav.cucullata_130       GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2023}
L.rubescens_w284            GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2009}
Myrmecophila_281            GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1999}
C.dowiana_282               GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1953}
Rhy.glauca_N134             GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2015}
C.forbesii_59               GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1892}
Soph.cernua_145             GACACAAGGATTCTTTTTCTTCTCATTTTTATTCTCAAATGGTATCAGAA    {2002}
L.purpurata_84              GGCACAAGAATTCTTTTTCTTCTCATTTTTATTCTAAAATGGTATCAGAA    {2021}
Schm.splendida_280          GGCACAATAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2016}
E.citrina_54                GGTACAATAATTCTTTTTATTCTCATTTTTCTTCTAAAATGGTATCAGAA    {2015}
E.mariae_56                 GGCACAATAATTCTTTTCCTTCTCATCTCTCTTCTAAAATGGTATCAGAA    {2029}
E.mariae_87                 GGCACAATAATTCTATTTCTTCTCATTGTTCTTCTAAAATGGTATCAGAA    {2024}
D.polybulbon_61             GGCACAAAAATTCTCTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1981}
D.polybulbon_94             GGCACAAAAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2014}
E.adenocaula_12             GGCACAAGAATTATTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1978}
E.bractescens_21            GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2009}
E.aromatica_02              GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2047}
E.cordigera_24              GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2047}
E.tampensis_27              GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2005}
E.tampensis_alba_23         GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2018}
E.dichroma_74               GGCACAATAATTCTTTTTCTTCTCATTTTTATTCTAAAAGGGTATAAGAA    {1952}
E.diurna_09                 GGCACAAGAATTATTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2031}
E.asperula_65               GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2032}
E.candollei_29              GGCACAATAATTCTTTTTCTTCTCATTTTTATTCTAAAAGGGTATAAGAA    {1962}
E.randii_50                 GGCACAATAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2008}
E.kienastii_235             GGCATAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2031}
P.chimborazoensis_51        GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1992}
P.fragrans_172              GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2017}
P.aemula_17                 GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAVAA    {2025}
P.cochleata_31              GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2052}
P.pygmaea_81                GGCACAAGGATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2024}
P.pseudopygmaea_205         GGCACAAGGATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2023}
P.vitellina_57              GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2042}
P.glauca_176                GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2074}
P.ionocentra_46             GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2038}
P.prismatocarpa_19          GGCACAAGAATTCTTTTTCTTCTCGTTTTTCTTCTCAAATGGTATCAGAA    {1988}
P.ochracea_95               GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1975}
P.cretacea_230              GGCACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2019}
E.luteorosea_178            GGCACGAGAATTCTTTTTATTCTCATTTTTCTTATCAAATGGTATCAGAA    {1994}
E.luteorosea_173            GGCACGAGAATTCTTTTTATTCTCATTTTTCTTATCAAATGGTATCAGAA    {1991}
E.subulatifolia_128         GGCACAAGAATTCTTTTTCTTCTCATTTTTATTCTCAAATGGTATCAGAA    {2014}
E.subulatifolia_174         GTCACAAGAATTCTTTTTCTTCTCATTTCTATTCTCAAATGGTATCAGAA    {2059}
E.cyanocolumna_1001         GACACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {2024}
E.tenuissima_143            GATACAAGAATTCTTTTTCTTCTCATTTTTCTTCTCAAATGGTATCAGAA    {1805}
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Appendix G—continued.

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{                                                   2810      2820      2830      2840      2850}
{                                                      .         .         .         .         .}
Restrepiella_291          GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTGGCGATTAGTATCTTC  {2242}
Pluer.racemiflora_140     GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCACGATTAGTATCTTC  {2211}
Ponera.striata_197        GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2178}
Isochilis.major_279       GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2307}
Epi.ibaguense_60          GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2107}
Epi.conopseum_244         GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2018}
Nidema.boothii_192        GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2049}
S._pulchella_W208         GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2065}
H.imbricata_283           GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2083}
Reichenbachanthus_W107    GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {1961}
Hexadesmia_K336           GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2062}
Acrorchis_399             GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2069}
Jacquiniella_313          GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2077}
Hagsatera_229             GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2089}
Homalopetalum_234         GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2043}
Meiracyllium_trinas_129   GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2062}
Psy.mcconnelliae_W53R     GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2031}
Psy.krugii_62             GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2041}
Brough.nigrilensis_152    GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATTTTC  {2039}
Tetramica.elegans_160     GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCACGATTAGTATCTTC  {2089}
Domingoa_225              GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2047}
Cattleyopsis_251          GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2053}
Brassav.cucullata_130     GGTTTTGGAGTCATTCTGGAAATTCCATTCTCATCGCGATTAGTATCTTC  {2073}
L.rubescens_w284          GGTTTTGGAGTCATTCTGGAAATTCCATTTTCGTCGCGATTAGTATCTTA  {2059}
Myrmecophila_281          GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2049}
C.dowiana_282             GGTTTTGGAGTCATTCTGGAAATTCCATTCTTGTCGCGATTAGTATCTTC  {2003}
Rhy.glauca_N134           GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2065}
C.forbesii_59             GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {1942}
Soph.cernua_145           GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2052}
L.purpurata_84            GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2071}
Schm.splendida_280        GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTA  {2066}
E.citrina_54              GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2065}
E.mariae_56               GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2079}
E.mariae_87               GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2074}
D.polybulbon_61           GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2031}
D.polybulbon_94           GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2064}
E.adenocaula_12           GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2028}
E.bractescens_21          GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2059}
E.aromatica_02            GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2097}
E.cordigera_24            GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2097}
E.tampensis_27            GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2055}
E.tampensis_alba_23       GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2068}
E.dichroma_74             GGTTTTGGAGTAATTCTGGAAATTCCATT------------AGTATCTTC  {1990}
E.diurna_09               GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2081}
E.asperula_65             GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2082}
E.candollei_29            GGTTTTTGAGTAATTCTGGAAATTCCATT------------AGTATCTTC  {2000}
E.randii_50               GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTA  {2058}
E.kienastii_235           GGCTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2081}
P.chimborazoensis_51      GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2042}
P.fragrans_172            GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2067}
P.aemula_17               GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2075}
P.cochleata_31            GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2102}
P.pygmaea_81              GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2074}
P.pseudopygmaea_205       GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2073}
P.vitellina_57            GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2092}
P.glauca_176              GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2124}
P.ionocentra_46           GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGGTTAGTATCTTC  {2088}
P.prismatocarpa_19        GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGGTTAGTATCTTC  {2038}
P.ochracea_95             GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2025}
P.cretacea_230            GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2069}
E.luteorosea_178          GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2044}
E.luteorosea_173          GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2041}
E.subulatifolia_128       GGTTTTGGAGTCATTCTGGAAATTCCATTCTCATCGCGATTAGTATCTTC  {2064}
E.subulatifolia_174       GGTTTTGGAGTCATTCTGGAAATTCCATTCTCATCGCGATTAGTATCTTC  {2109}
E.cyanocolumna_1001       GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {2074}
E.tenuissima_143          GGTTTTGGAGTCATTCTGGAAATTCCATTCTCGTCGCGATTAGTATCTTC  {1855}
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Appendix G—continued.

{	2860 2870 2880 2890 2900}	
{	. . . . .}	
Restrepiella_291	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2292}
Pluer.racemiflora_140	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2261}
Ponera.striata_197	CTTTGAAGAAAAAAGAATACCAAAATTTCATAATTTACAATCTATTCATT	{2228}
Isochilis.major_279	CCTTGAAGAAAAAAGAATACCAAAATTTCAGAATTTACAATCTATTCATT	{2357}
Epi.ibaguense_60	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2157}
Epi.conopseum_244	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2068}
Nidema.boothii_192	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2099}
S._pulchella_W208	TCTTGAAGAAAAAAGAATAACAAAATCTCAGAATTTACGATCTATTCATT	{2115}
H.imbricata_283	TCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2133}
Reichenbachanthus_W107	TCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2011}
Hexadesmia_K336	TCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2112}
Acrorchis_399	TCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2119}
Jacquiniella_313	TCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2127}
Hagsatera_229	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2139}
Homalopetalum_234	CCTTGAAGAAAAAAGAATACCAAAATTTCAGAATTTACGATCTATTCATT	{2093}
Meiracyllium_trinas_129	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2112}
Psy.mcconnelliae_W53R	CCTTGAAGAAAAAAGAATACCAAAATTTCAGAATTTACGATCTATTCATT	{2081}
Psy.krugii_62	CCTTGAAGAAAAAAGAATACCAAAATTTCAGAATTTACGATCTATTCATT	{2091}
Brough.nigrilensis_152	CCTTGAAGAAAAAAGAATACCAAAATTTCAGAATTTACGATCTATTCATT	{2089}
Tetramica.elegans_160	CCTTGAAGAAAAAAGAATACCAAGATTTCAGAATTTACGATCTATTCATT	{2139}
Domingoa_225	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2097}
Cattleyopsis_251	CCTTGAAGAAAAAAGAATACCAAAATTTCAGAATTTACGATCTATTCATT	{2103}
Brassav.cucullata_130	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2123}
L.rubescens_w284	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2109}
Myrmecophila_281	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2099}
C.dowiana_282	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2053}
Rhy.glauca_N134	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2115}
C.forbesii_59	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{1992}
Soph.cernua_145	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2102}
L.purpurata_84	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2121}
Schm.splendida_280	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2116}
E.citrina_54	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2115}
E.mariae_56	CCTTGAAGAAAAAAGAATACCAAMATATCAGAATTTACGATCTATTCATT	{2129}
E.mariae_87	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2124}
D.polybulbon_61	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2081}
D.polybulbon_94	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2114}
E.adenocaula_12	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2078}
E.bractescens_21	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2109}
E.aromatica_02	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2147}
E.cordigera_24	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2147}
E.tampensis_27	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2105}
E.tampensis_alba_23	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2118}
E.dichroma_74	CCTTGAAGAAAAAAGAATACCAAAATCTCATAATTTACGATCTATTCATT	{2040}
E.diurna_09	CCTTGAAGAAAAAAGAATACAARAATATCAGAATTTACGATCTATTCATT	{2131}
E.asperula_65	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATCTACGATCTATTCATT	{2132}
E.candollei_29	CCTTGAAGAAAAAAGAATACCAAAATCTCATAATTTACGATCTATTCATT	{2050}
E.randii_50	CCTTGAAGAAAAAAGAATACCAAAATCTCAGAATTTACGATCTATTCATT	{2108}
E.kienastii_235	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2131}
P.chimborazoensis_51	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2092}
P.fragrans_172	CCTTGAAGAGAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2117}
P.aemula_17	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2125}
P.cochleata_31	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACAATCTATTCATT	{2152}
P.pygmaea_81	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2124}
P.pseudopygmaea_205	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2123}
P.vitellina_57	TCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2142}
P.glauca_176	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2174}
P.ionocentra_46	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2138}
P.prismatocarpa_19	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2088}
P.ochracea_95	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2075}
P.cretacea_230	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2119}
E.luteorosea_178	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2094}
E.luteorosea_173	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2091}
E.subulatifolia_128	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2114}
E.subulatifolia_174	CCTTGAAGAAAAAAGAATGCCAAAATATCAGAATTTACGATCTATTCATT	{2159}
E.cyanocolumna_1001	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{2124}
E.tenuissima_143	CCTTGAAGAAAAAAGAATACCAAAATATCAGAATTTACGATCTATTCATT	{1905}

Appendix G—continued.

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{                                    2910      2920      2930      2940      2950}
{                                       .         .         .         .         .}
Restrepiella_291              CAATATTTCCCTTTTTAGAAGATAAATTATCACATTTAAATTATGTGTCA   {2342}
Pluer.racemiflora_140         CAATATTTCCCTTTTTAGAGGATAAATTATCACATTTAAATTATGTGTCA   {2311}
Ponera.striata_197            CAATATTTCCCTTTTTAGAGGATAAATTATCACATTTAAATTATGTGTCA   {2278}
Isochilis.major_279           CAATATTTCCCTTTTTAGAGGATAAATTATCACATTTAAATTATGTGTCA   {2407}
Epi.ibaguense_60              CAATATTTCCTTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2207}
Epi.conopseum_244             CAATATTTCCTTTTTTAGAGGATAAATTATTACATATAAATTATGTGTCA   {2118}
Nidema.boothii_192            CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2149}
S._pulchella_W208             CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAGATTATGTGTCA   {2165}
H.imbricata_283               CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2183}
Reichenbachanthus_W107        CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2061}
Hexadesmia_K336               CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2162}
Acrorchis_399                 CAATATTTCCTTTTTTAGAGGATAAATTATTACATTTCAATTATGTGTCA   {2169}
Jacquiniella_313              CAATATTTCCTTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2177}
Hagsatera_229                 CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTCAATTATGTGTCA   {2189}
Homalopetalum_234             CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2143}
Meiracyllium_trinas_129       CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2162}
Psy.mcconnelliae_W53R         CAATATTTCCCTTTTTAGAGGATAAATTCTTACATTTAAATTATGTGTCA   {2131}
Psy.krugii_62                 CAATATTTCCCTTTTTAGAGGATAAATTCTTACATTTAAATTATGTGTCA   {2141}
Brough.nigrilensis_152        CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2139}
Tetramica.elegans_160         CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2189}
Domingoa_225                  CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2147}
Cattleyopsis_251              CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2153}
Brassav.cucullata_130         CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2173}
L.rubescens_w284              CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2159}
Myrmecophila_281              CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2149}
C.dowiana_282                 CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2103}
Rhy.glauca_N134               CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTCAATTATGTGTCA   {2165}
C.forbesii_59                 CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2042}
Soph.cernua_145               CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2152}
L.purpurata_84                CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2171}
Schm.splendida_280            CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2166}
E.citrina_54                  CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2165}
E.mariae_56                   CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2179}
E.mariae_87                   CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2174}
D.polybulbon_61               CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2131}
D.polybulbon_94               CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2164}
E.adenocaula_12               CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTCAATTATGTGTCA   {2128}
E.bractescens_21              CAATATTTCCCTTTTTAGAGGATAAATTATTACWTTTAAATTATGTGTCA   {2159}
E.aromatica_02                CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTCAATTATGTGTCA   {2197}
E.cordigera_24                CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTCAATTATGTGTCA   {2197}
E.tampensis_27                CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTCAATTATGTGTCA   {2155}
E.tampensis_alba_23           CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTCAATTATGTGTCA   {2168}
E.dichroma_74                 CAATATTTCCCTTTTTAGAGGAKAAATTMTCACATTKAAATTATGTGTCA   {2090}
E.diurna_09                   CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTCAATTATGTGTCA   {2181}
E.asperula_65                 CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTCAATTATGTGTCA   {2182}
E.candollei_29                CAATATTTCCCTTTTTAGAGGAGAAATTCTCACATTGAAATTATGTGTCA   {2100}
E.randii_50                   CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2158}
E.kienastii_235               CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2181}
P.chimborazoensis_51          CAATATTTCCCTATTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2142}
P.fragrans_172                CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2167}
P.aemula_17                   CAATATTTCCCTTTTTAGAGGATAAATTATTACATCTAGATTATGTGTCT   {2175}
P.cochleata_31                CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2202}
P.pygmaea_81                  CAATATTTCCCTTTTTAGAGGATAAATTAGTACATTTAAATTATGTGTCA   {2174}
P.pseudopygmaea_205           CAATATTTCCCTTTTTAGAGGATAAATTAGTACATTTAAATTATGTGTCA   {2173}
P.vitellina_57                CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2192}
P.glauca_176                  CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2224}
P.ionocentra_46               CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2188}
P.prismatocarpa_19            CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2138}
P.ochracea_95                 CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2125}
P.cretacea_230                CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2169}
E.luteorosea_178              CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTATCA   {2144}
E.luteorosea_173              CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTATCA   {2141}
E.subulatifolia_128           CAATATTTCCCTTTTTAGAGGATAAATTATCACATTTAAATTATGTGTCA   {2164}
E.subulatifolia_174           CAATATTTCCCTTTTTAGAGGATAAATTATCACATCTAAATTATGTGTCA   {2209}
E.cyanocolumna_1001           CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {2174}
E.tenuissima_143              CAATATTTCCCTTTTTAGAGGATAAATTATTACATTTAAATTATGTGTCA   {1955}
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Appendix G—continued.

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{                                             2960      2970      2980      2990      3000}
{                                                .         .         .         .         .}
Restrepiella_291               GATTTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2392}
Pluer.racemiflora_140          GATCTACTAATACCCCATCCCATCCATCTGGAAATCTTGGTTCAAATCCT    {2361}
Ponera.striata_197             GATCTACTAATACCCCACCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2328}
Isochilis.major_279            GATCTACTAATACCCCACCCCATCCATCTGGAAATCTTGGTTCAAATCCT    {2457}
Epi.ibaguense_60               GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2257}
Epi.conopseum_244              GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2168}
Nidema.boothii_192             GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2199}
S._pulchella_W208              GATCTACTAATACCCCACCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2215}
H.imbricata_283                GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2233}
Reichenbachanthus_W107         GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2111}
Hexadesmia_K336                GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2212}
Acrorchis_399                  GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2219}
Jacquiniella_313               GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2227}
Hagsatera_229                  GATCTACTAATACCC-ATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2238}
Homalopetalum_234              GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2193}
Meiracyllium_trinas_129        GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2212}
Psy.mcconnelliae_W53R          GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2181}
Psy.krugii_62                  GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2191}
Brough.nigrilensis_152         GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2189}
Tetramica.elegans_160          GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2239}
Domingoa_225                   GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2197}
Cattleyopsis_251               GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2203}
Brassav.cucullata_130          GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2223}
L.rubescens_w284               GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2209}
Myrmecophila_281               GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2199}
C.dowiana_282                  GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2153}
Rhy.glauca_N134                GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2215}
C.forbesii_59                  GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2092}
Soph.cernua_145                GATCTACTAATACCCCATCCCATCCATCTGGAAATCTTGGTTCAAATCCT    {2202}
L.purpurata_84                 GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATTCT    {2221}
Schm.splendida_280             GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAACCCT    {2216}
E.citrina_54                   GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2215}
E.mariae_56                    GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2229}
E.mariae_87                    GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2224}
D.polybulbon_61                GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2181}
D.polybulbon_94                GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2214}
E.adenocaula_12                GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2178}
E.bractescens_21               GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2209}
E.aromatica_02                 GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2247}
E.cordigera_24                 GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGTTTCAAATCCT    {2247}
E.tampensis_27                 GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2205}
E.tampensis_alba_23            GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2218}
E.dichroma_74                  GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2140}
E.diurna_09                    GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2231}
E.asperula_65                  GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2232}
E.candollei_29                 GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2150}
E.randii_50                    GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2208}
E.kienastii_235                GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2231}
P.chimborazoensis_51           GATCTACTAATACCCCATCCCATCCATCTGGAGATCCTGGTTCAAATCCT    {2192}
P.fragrans_172                 GATCTACTAATACCCCATCCCATCCATCTGGAGATCCTGGTTCAAATCCT    {2217}
P.aemula_17                    GATCTACTAATACCCCATCCCATCCATCTGGAGATCCTGGTTCAAATCCT    {2225}
P.cochleata_31                 GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2252}
P.pygmaea_81                   GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2224}
P.pseudopygmaea_205            GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2223}
P.vitellina_57                 GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2242}
P.glauca_176                   GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2274}
P.ionocentra_46                GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2238}
P.prismatocarpa_19             GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2188}
P.ochracea_95                  GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2175}
P.cretacea_230                 GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2219}
E.luteorosea_178               GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2194}
E.luteorosea_173               GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2191}
E.subulatifolia_128            GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2214}
E.subulatifolia_174            GATCTACTAATACCCTATCCCATCCATCTGGAAATCTTGGTTCAAATCCT    {2259}
E.cyanocolumna_1001            GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATACT    {2224}
E.tenuissima_143               GATCTACTAATACCCCATCCCATCCATCTGGAGATCTTGGTTCAAATCCT    {2005}
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Appendix G—continued.

{	3010 3020 3030 3040 3050}	
{	. . . . .}	
Restrepiella_291	TCAATGTTGGATCAAAGATGTTCCTTCTTTGCATTTATTGCGATTGTTTT	{2442}
Pluer.racemiflora_140	TCAATGTTGGATCAAAGATGTTCCTTCTTTGCATTTATTGCGATTGTTTT	{2411}
Ponera.striata_197	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTCTTGCGATTGTTTT	{2378}
Isochilis.major_279	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2507}
Epi.ibaguense_60	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2307}
Epi.conopseum_244	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2218}
Nidema.boothii_192	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2249}
S._pulchella_W208	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2265}
H.imbricata_283	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2283}
Reichenbachanthus_W107	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2161}
Hexadesmia_K336	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2262}
Acrorchis_399	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2269}
Jacquiniella_313	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2277}
Hagsatera_229	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2288}
Homalopetalum_234	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTATTTT	{2243}
Meiracyllium_trinas_129	TCAATGCTGGATCAAAGATGTTCCTTCTYTGCATTTATTACGATTGTTTT	{2262}
Psy.mcconnelliae_W53R	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2231}
Psy.krugii_62	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2241}
Brough.nigrilensis_152	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2239}
Tetramica.elegans_160	TCAATGCTGGATCAAAGACGTTCCTTCTTTGCATTTATTACGATTGTCTT	{2289}
Domingoa_225	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2247}
Cattleyopsis_251	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2253}
Brassav.cucullata_130	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2273}
L.rubescens_w284	TCAATGCTGGATCAAAGATATTCCTTCTTTGCATTTATTACGATTGTTTT	{2259}
Myrmecophila_281	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2249}
C.dowiana_282	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2203}
Rhy.glauca_N134	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2265}
C.forbesii_59	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2142}
Soph.cernua_145	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2252}
L.purpurata_84	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2271}
Schm.splendida_280	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2266}
E.citrina_54	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2265}
E.mariae_56	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATATATTACGATTGTTTC	{2279}
E.mariae_87	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2274}
D.polybulbon_61	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2231}
D.polybulbon_94	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2264}
E.adenocaula_12	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2228}
E.bractescens_21	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATAGTTTT	{2259}
E.aromatica_02	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2297}
E.cordigera_24	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2297}
E.tampensis_27	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2255}
E.tampensis_alba_23	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2268}
E.dichroma_74	TCAATGCTGGATAAAAGATGTTCCTTCTTTGCATTTATTGCGATTGTTTT	{2190}
E.diurna_09	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2281}
E.asperula_65	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2282}
E.candollei_29	TCAATGCTGGATAAAAGATGTTCCTTCTTTGCATTTATTGCGATTGTTTT	{2200}
E.randii_50	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2258}
E.kienastii_235	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2281}
P.chimborazoensis_51	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2242}
P.fragrans_172	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2267}
P.aemula_17	TCAATGCTGGATCAAAGATGTTCCTYCTTTGCATTTATTACGATTGTTTT	{2275}
P.cochleata_31	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2302}
P.pygmaea_81	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2274}
P.pseudopygmaea_205	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2273}
P.vitellina_57	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2292}
P.glauca_176	TCAATGCTGGATCAAAGATGTTCCCTCTTTGCATTTATTACGATTGTTTT	{2324}
P.ionocentra_46	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2288}
P.prismatocarpa_19	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2238}
P.ochracea_95	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2225}
P.cretacea_230	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2269}
E.luteorosea_178	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2244}
E.luteorosea_173	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2241}
E.subulatifolia_128	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTGCGATTGTTTT	{2264}
E.subulatifolia_174	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTCTTGCGATTGTTTT	{2309}
E.cyanocolumna_1001	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2274}
E.tenuissima_143	TCAATGCTGGATCAAAGATGTTCCTTCTTTGCATTTATTACGATTGTTTT	{2055}

Appendix G—continued.

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{                                          3060      3070      3080      3090     3100}
{                                             .         .         .         .        .}
Restrepiella_291              TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2486}
Pluer.racemiflora_140         TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2455}
Ponera.striata_197            TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2422}
Isochilis.major_279           TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2551}
Epi.ibaguense_60              TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2351}
Epi.conopseum_244             TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2262}
Nidema.boothii_192            TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2293}
S._pulchella_W208             TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2309}
H.imbricata_283               TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2327}
Reichenbachanthus_W107        TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2205}
Hexadesmia_K336               TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2306}
Acrorchis_399                 TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2313}
Jacquiniella_313              TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2321}
Hagsatera_229                 TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2332}
Homalopetalum_234             TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2287}
Meiracyllium_trinas_129       TTCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2306}
Psy.mcconnelliae_W53R         TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTTAAAGAAA   {2275}
Psy.krugii_62                 TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTTAAAGAAA   {2285}
Brough.nigrilensis_152        TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2283}
Tetramica.elegans_160         TCCACGAATATCAYAATTTGAATAGTCTCATTAC------TTCAAACAAA   {2333}
Domingoa_225                  TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2291}
Cattleyopsis_251              TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAG   {2297}
Brassav.cucullata_130         TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2317}
L.rubescens_w284              TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2303}
Myrmecophila_281              TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2293}
C.dowiana_282                 TCCACGAATATCATAATTTGAATAATCTCATTAC------TTCAAAGAAA   {2247}
Rhy.glauca_N134               TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2309}
C.forbesii_59                 TCCACGAATATCATAATTTGAATAGTCTAATTAC------TTCAAAGAAA   {2186}
Soph.cernua_145               TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2296}
L.purpurata_84                TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2315}
Schm.splendida_280            TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2310}
E.citrina_54                  TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2309}
E.mariae_56                   TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2323}
E.mariae_87                   TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2318}
D.polybulbon_61               TCCACGAATATCATAATTTGAATAGTTTCATTAC------TTCAAAGAAA   {2275}
D.polybulbon_94               TCCACGAATATCATAATTTGAATAGTTTCATTAC------TTCAAAGAAA   {2308}
E.adenocaula_12               TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2272}
E.bractescens_21              TCCACGAATATCATAATTTGAATAGTCTCATTACTATTACTTCAAAGAAA   {2309}
E.aromatica_02                TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2341}
E.cordigera_24                TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2341}
E.tampensis_27                TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2299}
E.tampensis_alba_23           TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2312}
E.dichroma_74                 TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2234}
E.diurna_09                   TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2325}
E.asperula_65                 TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2326}
E.candollei_29                TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTAAAAGAAA   {2244}
E.randii_50                   TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2302}
E.kienastii_235               TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2325}
P.chimborazoensis_51          TCCACGAATATCATAATTTGAATAGTCTCATTAC------WTCAATGAAA   {2286}
P.fragrans_172                TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAATGAAA   {2311}
P.aemula_17                   TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAATGAAA   {2319}
P.cochleata_31                TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2346}
P.pygmaea_81                  TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2318}
P.pseudopygmaea_205           TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2317}
P.vitellina_57                TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2336}
P.glauca_176                  TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2368}
P.ionocentra_46               TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2332}
P.prismatocarpa_19            TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2282}
P.ochracea_95                 TCCACGAATATCATAATTTGGATAGTCTCATTAC------TTCAAAGAAA   {2269}
P.cretacea_230                TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2313}
E.luteorosea_178              TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2288}
E.luteorosea_173              TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2285}
E.subulatifolia_128           TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2308}
E.subulatifolia_174           TCCACGAATCGCATAATTTGAATAATCTCATTAC------TTCAACTAAA   {2353}
E.cyanocolumna_1001           TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2318}
E.tenuissima_143              TCCACGAATATCATAATTTGAATAGTCTCATTAC------TTCAAAGAAA   {2099}
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Appendix G—continued.

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{                                          3110      3120      3130      3140      3150}
{                                             .         .         .         .         .}
Restrepiella_291          TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCCTACA   {2536}
Pluer.racemiflora_140     TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCCTACA   {2505}
Ponera.striata_197        TCCTTTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTTGTTCCTAAA   {2472}
Isochilis.major_279       TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCCTACA   {2601}
Epi.ibaguense_60          TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTTGTTCTTACA   {2401}
Epi.conopseum_244         TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2312}
Nidema.boothii_192        TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTTGTTCTTACA   {2343}
S._pulchella_W208         TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2359}
H.imbricata_283           TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2377}
Reichenbachanthus_W107    TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2255}
Hexadesmia_K336           TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2356}
Acrorchis_399             TCCATTTACGTCTTTTCTAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2363}
Jacquiniella_313          TCCATTTACGTCTTTTCTAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2371}
Hagsatera_229             TCCATTTACGTCTTTTCAAAAAGAAATAAAAGATTCTCTTGGTTCTTACA   {2382}
Homalopetalum_234         TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2337}
Meiracyllium_trinas_129   CCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2356}
Psy.mcconnelliae_W53R     TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGAT-CTTTTGGTTCTTACA   {2324}
Psy.krugii_62             TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2335}
Brough.nigrilensis_152    TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2333}
Tetramica.elegans_160     TCCATTGACTTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2383}
Domingoa_225              TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2341}
Cattleyopsis_251          TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2347}
Brassav.cucullata_130     TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTTGTTCTTACA   {2367}
L.rubescens_w284          TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2353}
Myrmecophila_281          TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2343}
C.dowiana_282             TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2297}
Rhy.glauca_N134           TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2359}
C.forbesii_59             TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2236}
Soph.cernua_145           TCCATTTACGTCTTTTCAAAAACAAAGAAAAGATTCTTTTGGTTCTTACA   {2346}
L.purpurata_84            TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2365}
Schm.splendida_280        TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2360}
E.citrina_54              TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2359}
E.mariae_56               TCTATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2373}
E.mariae_87               TCTATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2368}
D.polybulbon_61           TCTATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTTGTTCTTACA   {2325}
D.polybulbon_94           TCTATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTTGTTCTTACA   {2358}
E.adenocaula_12           TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2322}
E.bractescens_21          TCCATTTACGTATTTTCAAAAAGAAAGAAAAGATTCTCTTGGTTATTACA   {2359}
E.aromatica_02            TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2391}
E.cordigera_24            TCCATTTATGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2391}
E.tampensis_27            TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTWTTGGTTCTTACA   {2349}
E.tampensis_alba_23       TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTCTTGGTTCTTACA   {2362}
E.dichroma_74             TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCCTACA   {2284}
E.diurna_09               TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTCTTGGTTCTTACA   {2375}
E.asperula_65             TCCATTTATGTCTTTTCCAAAAGAAAGAAAAGATTCTCTTGGTTCTTACA   {2376}
E.candollei_29            TCCATTTACGTCTTTTAAAAAAGAAAGAAAAGATTCTTTTGGTTCYTACA   {2294}
E.randii_50               TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2352}
E.kienastii_235           TCCATTTACGTTTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2375}
P.chimborazoensis_51      TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTWACA   {2336}
P.fragrans_172            TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2361}
P.aemula_17               TCCATTTACGTCTWTTCAAAAAGAAAGAAAAGATTCTTTTGGTTATTACA   {2369}
P.cochleata_31            TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2396}
P.pygmaea_81              TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2368}
P.pseudopygmaea_205       TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2367}
P.vitellina_57            TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2386}
P.glauca_176              TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTATTACA   {2418}
P.ionocentra_46           TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2382}
P.prismatocarpa_19        TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2332}
P.ochracea_95             TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2319}
P.cretacea_230            TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2363}
E.luteorosea_178          TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2338}
E.luteorosea_173          TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2335}
E.subulatifolia_128       TCCATTTACGTCTTTTCAAAAAGAAAGAAAAGATTCTTTTGGTTCTTACA   {2358}
E.subulatifolia_174       TTTATTTACGTCTTTTCCAAAATAAAGAAAAGATTCTTTTGGTTCTTACA   {2403}
E.cyanocolumna_1001       TCCATTTACGTCTTTTCAAAAAGAAATAAAAGATTCTTTTGGTTCTTACA   {2368}
E.tenuissima_143          TCCATTTACGTCTTTTCAAAAAGAAATCAAAGATTCTCTTGGTTCTTACA   {2149}
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Appendix G—continued.

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{                                          3160      3170      3180      3190      3200}
{                                             .         .         .         .         .}
Restrepiella_291           TAATTCTTATGTATCTGAATGCGAATATATATTCCTGTTTATTCGTAAAA   {2586}
Pluer.racemiflora_140      TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2555}
Ponera.striata_197         TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2522}
Isochilis.major_279        TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2651}
Epi.ibaguense_60           TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2451}
Epi.conopseum_244          TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2362}
Nidema.boothii_192         TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2393}
S._pulchella_W208          TAATTCTTATGTATATGAATGCGAATATCTATTTCTGTTTCTTCGTAAAC   {2409}
H.imbricata_283            TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2427}
Reichenbachanthus_W107     TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2305}
Hexadesmia_K336            TAATTCTTATGTATATGAATGTGAATATCTATTCCTGTTTCTTCGTAAAC   {2406}
Acrorchis_399              TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2413}
Jacquiniella_313           TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2421}
Hagsatera_229              TAATTCCTATGTTTATGAATGCGAATATCTATTCCTGTTTCTTCGTCAAC   {2432}
Homalopetalum_234          TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2387}
Meiracyllium_trinas_129    TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2406}
Psy.mcconnelliae_W53R      TAATTCTTATGTATATGAATGTGAATATCTATTCCTGTTTCTCCGTAAAC   {2374}
Psy.krugii_62              TAATTCTTATGTATATGAATGTGAATATCTATTCCTGTTTCTTCGTAAAC   {2385}
Brough.nigrilensis_152     TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2383}
Tetramica.elegans_160      TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2433}
Domingoa_225               TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2391}
Cattleyopsis_251           TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2397}
Brassav.cucullata_130      TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2417}
L.rubescens_w284           TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTATTCGTAAAC   {2403}
Myrmecophila_281           TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2393}
C.dowiana_282              TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2347}
Rhy.glauca_N134            TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2409}
C.forbesii_59              TAATTCTTATGTATATGAATGTGAATATCTATTCCTGTT-CTTCGTAAAC   {2285}
Soph.cernua_145            TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2396}
L.purpurata_84             TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2415}
Schm.splendida_280         TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2410}
E.citrina_54               TAATTCTTATGTTTATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2409}
E.mariae_56                TAATTCTTATGTTTATGAATGCGAATATCTATCCCTGTTTCTTCGTAAAA   {2423}
E.mariae_87                TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAA   {2418}
D.polybulbon_61            TAATTCTTATGTCTATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2375}
D.polybulbon_94            TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2408}
E.adenocaula_12            TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAA   {2372}
E.bractescens_21           TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2409}
E.aromatica_02             TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2441}
E.cordigera_24             TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2441}
E.tampensis_27             TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2399}
E.tampensis_alba_23        TAATTCCTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2412}
E.dichroma_74              TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2334}
E.diurna_09                TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2425}
E.asperula_65              TAATTCTTATGTATATGATTGCGAATATCTATTCCTGTTTCTTCGTTAAC   {2426}
E.candollei_29             TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2344}
E.randii_50                TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2402}
E.kienastii_235            TAATTCTTATGTTTATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2425}
P.chimborazoensis_51       TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2386}
P.fragrans_172             TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2411}
P.aemula_17                TAATTCTYATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2419}
P.cochleata_31             TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2446}
P.pygmaea_81               TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2418}
P.pseudopygmaea_205        TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2417}
P.vitellina_57             TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2436}
P.glauca_176               TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2468}
P.ionocentra_46            TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2432}
P.prismatocarpa_19         TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2382}
P.ochracea_95              TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAA   {2369}
P.cretacea_230             TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2413}
E.luteorosea_178           TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCATAAAC   {2388}
E.luteorosea_173           TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCATAAAC   {2385}
E.subulatifolia_128        TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAC   {2408}
E.subulatifolia_174        TAATTCTTATGTCTTTGAATTCGAATATCTATTCCTGTTTCTTCGTAAAC   {2453}
E.cyanocolumna_1001        TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAA   {2418}
E.tenuissima_143           TAATTCTTATGTATATGAATGCGAATATCTATTCCTGTTTCTTCGTAAAA   {2199}
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Appendix G—continued.

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{                                              3210      3220      3230      3240      3250}
{                                                 .         .         .         .         .}
Restrepiella_291                AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2636}
Pluer.racemiflora_140           AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2605}
Ponera.striata_197              AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2572}
Isochilis.major_279             AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2701}
Epi.ibaguense_60                AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2501}
Epi.conopseum_244               AGTCTTCTTATTTACGATCAATATCTTATGGAGTCTTTCTTGAGCGAACA   {2412}
Nidema.boothii_192              AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2443}
S._pulchella_W208               AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTCGAGCGAACA   {2459}
H.imbricata_283                 AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTCGAGCGAACA   {2477}
Reichenbachanthus_W107          AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTCGAGCGAACA   {2355}
Hexadesmia_K336                 AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTCGAGCGAACA   {2456}
Acrorchis_399                   AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2463}
Jacquiniella_313                AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2471}
Hagsatera_229                   AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2482}
Homalopetalum_234               AGTCTTCTTATTTACGATCAATATCTTATGGAGTCTTTCTTGAGCGAACA   {2437}
Meiracyllium_trinas_129         AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2456}
Psy.mcconnelliae_W53R           AGTCTCCTTATTTACAATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2424}
Psy.krugii_62                   AGTCTTCTTATTTACAATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2435}
Brough.nigrilensis_152          AGTCTTCTTATTTACGATCAACATCTTCTGGAGTCTTTCTTGAGCGAACA   {2433}
Tetramica.elegans_160           AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTYCTTGAGCGAACA   {2483}
Domingoa_225                    AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCCTGAGCGAACA   {2441}
Cattleyopsis_251                AGTCTTCTTATTTACGATCAACATCTTCTGGAATCTTTCTTGAGCGAACA   {2447}
Brassav.cucullata_130           AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2467}
L.rubescens_w284                AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2453}
Myrmecophila_281                AGTCTTSTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2443}
C.dowiana_282                   AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2397}
Rhy.glauca_N134                 AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2459}
C.forbesii_59                   AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2335}
Soph.cernua_145                 AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2446}
L.purpurata_84                  AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2465}
Schm.splendida_280              AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2460}
E.citrina_54                    AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2459}
E.mariae_56                     AGTCTTCTTACTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2473}
E.mariae_87                     AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2468}
D.polybulbon_61                 AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2425}
D.polybulbon_94                 AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2458}
E.adenocaula_12                 AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2422}
E.bractescens_21                AGTCTTCTTATTTACGATCAATATCTTATGGAGTCTTTCTTGAGCGAACA   {2459}
E.aromatica_02                  AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2491}
E.cordigera_24                  AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2491}
E.tampensis_27                  AGTMTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2449}
E.tampensis_alba_23             AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2462}
E.dichroma_74                   AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2384}
E.diurna_09                     AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2475}
E.asperula_65                   AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2476}
E.candollei_29                  AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2394}
E.randii_50                     AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2452}
E.kienastii_235                 AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2475}
P.chimborazoensis_51            AGTCTTCTTATTTACGACCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2436}
P.fragrans_172                  AGTCTTCTTATTTACGACCAATATCTTCTGGAGTCTTTCTTGAGCGCACA   {2461}
P.aemula_17                     AGTCTTCTTATTTACGACCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2469}
P.cochleata_31                  AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2496}
P.pygmaea_81                    AGTCTTCTTATTTACGATCAATATCTTATGGAGTCTTTCTTGAGCGAACA   {2468}
P.pseudopygmaea_205             AGTCTTCTTATTTACGATCAATATCTTATGGAGTCTTTCTTGAGCGAACA   {2467}
P.vitellina_57                  AGTCTTCTTATTTACGATCAATGTCTTCTGGAGTCTTTCTTGAGCGAACA   {2486}
P.glauca_176                    AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2518}
P.ionocentra_46                 AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2482}
P.prismatocarpa_19              AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2432}
P.ochracea_95                   AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2419}
P.cretacea_230                  AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2463}
E.luteorosea_178                AGTCTTCTTATTTACGATTAATATCTTCTGGAGTCTTTATTGAGCGAACA   {2438}
E.luteorosea_173                AGTCTTCTTATTTACGATTAATATCTTCTGGAGTCTTTATTGAGCGAACA   {2435}
E.subulatifolia_128             AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2458}
E.subulatifolia_174             AGTCTTCTTATTTACGATCAATATCTTCTGGAGTMTTTCTTGAGCGAACA   {2503}
E.cyanocolumna_1001             AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2468}
E.tenuissima_143                AGTCTTCTTATTTACGATCAATATCTTCTGGAGTCTTTCTTGAGCGAACA   {2249}
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Appendix G—continued.

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{                                      3260      3270      3280      3290      3300}
{                                         .         .         .         .         .}
Restrepiella_291             CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2686}
Pluer.racemiflora_140        CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2655}
Ponera.striata_197           CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2622}
Isochilis.major_279          CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2751}
Epi.ibaguense_60             CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2551}
Epi.conopseum_244            CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2462}
Nidema.boothii_192           CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2493}
S._pulchella_W208            CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2509}
H.imbricata_283              CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2527}
Reichenbachanthus_W107       CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2405}
Hexadesmia_K336              CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2506}
Acrorchis_399                CATTTGTATGGAAAAATAGAATATCTTATAGTCGTGTGTTCTAATTCTTT   {2513}
Jacquiniella_313             CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2521}
Hagsatera_229                CATTTCTATGGAAAAATAGGATATCTTATAGTCGTGTGTTGTAATTCTTT   {2532}
Homalopetalum_234            CATTTCTATGGAAAAATAGAATATCTTATAATCGTGTGTTGTAATTCTTT   {2487}
Meiracyllium_trinas_129      CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2506}
Psy.mcconnelliae_W53R        CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2474}
Psy.krugii_62                CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2485}
Brough.nigrilensis_152       CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2483}
Tetramica.elegans_160        CATTTCTATGGAAAAATAGAATATATTATAGTCGTGTGTTGTAATTCTTT   {2533}
Domingoa_225                 CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2491}
Cattleyopsis_251             CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2497}
Brassav.cucullata_130        CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2517}
L.rubescens_w284             CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2503}
Myrmecophila_281             CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2493}
C.dowiana_282                CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2447}
Rhy.glauca_N134              CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2509}
C.forbesii_59                CATTTCTATGGAAAGATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2385}
Soph.cernua_145              CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2496}
L.purpurata_84               CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2515}
Schm.splendida_280           CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2510}
E.citrina_54                 CATTTCTATGTAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2509}
E.mariae_56                  CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2523}
E.mariae_87                  CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2518}
D.polybulbon_61              CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2475}
D.polybulbon_94              CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2508}
E.adenocaula_12              CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2472}
E.bractescens_21             TATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2509}
E.aromatica_02               CATTTCTTTGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2541}
E.cordigera_24               CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2541}
E.tampensis_27               CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2499}
E.tampensis_alba_23          CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2512}
E.dichroma_74                CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2434}
E.diurna_09                  CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2525}
E.asperula_65                CATTTCTATGGAATAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2526}
E.candollei_29               CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2444}
E.randii_50                  CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2502}
E.kienastii_235              CATTTCTATGGAAAAATAGGATATCTTATAGTCGTGTGTTGTAATTCTTT   {2525}
P.chimborazoensis_51         CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2486}
P.fragrans_172               CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2511}
P.aemula_17                  CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2519}
P.cochleata_31               CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2546}
P.pygmaea_81                 CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2518}
P.pseudopygmaea_205          CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2517}
P.vitellina_57               CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2536}
P.glauca_176                 CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2568}
P.ionocentra_46              CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2532}
P.prismatocarpa_19           CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2482}
P.ochracea_95                CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2469}
P.cretacea_230               CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2513}
E.luteorosea_178             CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2488}
E.luteorosea_173             CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2485}
E.subulatifolia_128          CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2508}
E.subulatifolia_174          CATTTCTATGGAAAAATAGAATATCTTCTAGTCATGTGTTGTAATTCTTT   {2553}
E.cyanocolumna_1001          CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2518}
E.tenuissima_143             CATTTCTATGGAAAAATAGAATATCTTATAGTCGTGTGTTGTAATTCTTT   {2299}
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Appendix G—continued.

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Restrepiella_291	TCAGAGGATCTTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2736}
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Ponera.striata_197	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2672}
Isochilis.major_279	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2801}
Epi.ibaguense_60	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2601}
Epi.conopseum_244	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2512}
Nidema.boothii_192	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2543}
S._pulchella_W208	TAAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2559}
H.imbricata_283	TAAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2577}
Reichenbachanthus_W107	TAAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2455}
Hexadesmia_K336	TAAGAGGATCCCATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2556}
Acrorchis_399	TAATAGGATCCTATGGTTCCTCAAAGATAGTTTCATACATTATGTTCGAT	{2563}
Jacquiniella_313	TAATAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2571}
Hagsatera_229	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2582}
Homalopetalum_234	TCAGAGGATCCTATGGATCCTCAAAGATACTTTCATACATTATGTTCGAT	{2537}
Meiracyllium_trinas_129	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2556}
Psy.mcconnelliae_W53R	TCAGAGAATCCTATGGTTCCTCAAAGATACTTTTATACATTATGTTCGAT	{2524}
Psy.krugii_62	TCAGAGAATCCTATGGTTCCTCAAAGATACTTTTATACATTATGTTCGAT	{2535}
Brough.nigrilensis_152	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTTATACATTATGTTCGAT	{2533}
Tetramica.elegans_160	TCAGAGAATCCTATGGTTCCTCAAAGATACTTTTATACATTATGTTCGAT	{2583}
Domingoa_225	TCAGAGGAGCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2541}
Cattleyopsis_251	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTTATACATTATGTTCGAT	{2547}
Brassav.cucullata_130	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2567}
L.rubescens_w284	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2553}
Myrmecophila_281	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2543}
C.dowiana_282	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2497}
Rhy.glauca_N134	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2559}
C.forbesii_59	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2435}
Soph.cernua_145	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCGTACATTATGCTCGAT	{2546}
L.purpurata_84	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2565}
Schm.splendida_280	TCAGAGGATCCTATGGTTCTTCAAAGATACTTTCATACATTATGTTCGAT	{2560}
E.citrina_54	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2559}
E.mariae_56	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2573}
E.mariae_87	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2568}
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D.polybulbon_94	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2558}
E.adenocaula_12	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2522}
E.bractescens_21	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2559}
E.aromatica_02	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2591}
E.cordigera_24	TCAGAG-ATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2590}
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E.tampensis_alba_23	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2562}
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E.asperula_65	TCA-AGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2575}
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E.kienastii_235	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2575}
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P.fragrans_172	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2561}
P.aemula_17	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2569}
P.cochleata_31	TCAGAGGATCATATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2596}
P.pygmaea_81	CCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2568}
P.pseudopygmaea_205	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2567}
P.vitellina_57	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2586}
P.glauca_176	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2618}
P.ionocentra_46	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2582}
P.prismatocarpa_19	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2532}
P.ochracea_95	TCAGAGGATCCTATGGTTTCTCAAAGATACTTTCATACATTATATTCGAT	{2519}
P.cretacea_230	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2563}
E.luteorosea_178	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2538}
E.luteorosea_173	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2535}
E.subulatifolia_128	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2558}
E.subulatifolia_174	TCAGAGGATCCTATGGTTCCTCAAATATACTTTCATACATTATGTTCGAT	{2603}
E.cyanocolumna_1001	TCAGAGGATCCTATGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2568}
E.tenuissima_143	TCAGAGGATCCTCTGGTTCCTCAAAGATACTTTCATACATTATGTTCGAT	{2349}

Appendix G—continued.

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Restrepiella_291	ATCAAGGAAAAGCGATTATGGCTTCAAAAGGACTCTTTTTCTGATGAAT	{2786}
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Ponera.striata_197	ATCAAGGAAAAGCAATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2722}
Isochilis.major_279	ATCAAGGAAAAGCAATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2851}
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Epi.conopseum_244	ATCAAGGAAAAGTGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2562}
Nidema.boothii_192	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2593}
S._pulchella_W208	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATTAAG	{2609}
H.imbricata_283	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATTAAG	{2627}
Reichenbachanthus_W107	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATTAAG	{2505}
Hexadesmia_K336	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATTAAG	{2606}
Acrorchis_399	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2613}
Jacquiniella_313	ATCAAGGAAAAGCAATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2621}
Hagsatera_229	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2632}
Homalopetalum_234	ATCAAGGAAAAGCAATTCTGGCTCCAAAAGGACTCTTATTCTGATGAAG	{2587}
Meiracyllium_trinas_129	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2606}
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Psy.krugii_62	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTCTTCTGATGAAG	{2585}
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Tetramica.elegans_160	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTCTTCTGATGAAG	{2633}
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Cattleyopsis_251	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTCTTCTGATGAAG	{2597}
Brassav.cucullata_130	ATCAAGGAAAAGCAATTCTGGCTTCAAAAGGACTCTTATCCTGATGAAG	{2617}
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C.dowiana_282	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2547}
Rhy.glauca_N134	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2609}
C.forbesii_59	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2485}
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P.aemula_17	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2619}
P.cochleata_31	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2646}
P.pygmaea_81	ATCAAGGAAAAGCAATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2618}
P.pseudopygmaea_205	ATCAAGGAAAAGCAATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2617}
P.vitellina_57	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2636}
P.glauca_176	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2668}
P.ionocentra_46	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2632}
P.prismatocarpa_19	CTCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2582}
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E.luteorosea_178	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2588}
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E.subulatifolia_128	ATCAAGGAAAAGCGATTCTGGCTTCAAAAGGACTCTTATTCTGATGAAG	{2608}
E.subulatifolia_174	ATCAAGGAAAAGCAATTTTGGCTTCAAAAGGAACTCTTATTCTGATGAAG	{2653}
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Appendix G—continued.

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Ponera.striata_197	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2772}
Isochilis.major_279	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2901}
Epi.ibaguense_60	AAATGGAAATTTCATTTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2701}
Epi.conopseum_244	AAATGGAGATTGCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2612}
Nidema.boothii_192	AAATGGAAATTTCATCTTGTGAATCTTTGGCAATCTTATTTTCACTTTTG	{2643}
S._pulchella_W208	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2659}
H.imbricata_283	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2677}
Reichenbachanthus_W107	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2555}
Hexadesmia_K336	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2656}
Acrorchis_399	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2663}
Jacquiniella_313	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2671}
Hagsatera_229	AAATGGAAATTTCATATTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2682}
Homalopetalum_234	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2637}
Meiracyllium_trinas_129	AAATGGAAAATTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2656}
Psy.mcconnelliae_W53R	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2624}
Psy.krugii_62	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2635}
Brough.nigrilensis_152	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2633}
Tetramica.elegans_160	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2683}
Domingoa_225	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCATTTTTG	{2641}
Cattleyopsis_251	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2647}
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L.rubescens_w284	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2653}
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C.dowiana_282	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2597}
Rhy.glauca_N134	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2659}
C.forbesii_59	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2535}
Soph.cernua_145	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2646}
L.purpurata_84	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2665}
Schm.splendida_280	AAATGGAAATTTCATCTTGTTAATTTTTGGCAATATTATTTTCACTTTTG	{2660}
E.citrina_54	AAATGGAAATTTTATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2659}
E.mariae_56	AAATGGAAATTTTATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2673}
E.mariae_87	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2668}
D.polybulbon_61	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2625}
D.polybulbon_94	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2658}
E.adenocaula_12	AAATGGAAATTTCTTCTTGTGAATCTTTGGCAATCTTATTTTCACTTTTG	{2622}
E.bractescens_21	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2659}
E.aromatica_02	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2691}
E.cordigera_24	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2688}
E.tampensis_27	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2649}
E.tampensis_alba_23	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2662}
E.dichroma_74	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2584}
E.diurna_09	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2675}
E.asperula_65	AAATGGAAAATTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2675}
E.candollei_29	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTT	{2594}
E.randii_50	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2652}
E.kienastii_235	AAATGGAAATTTCATCTTGTGAATCTTTGGCAATCTTATTTTCACTTTTG	{2675}
P.chimborazoensis_51	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2636}
P.fragrans_172	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2661}
P.aemula_17	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2669}
P.cochleata_31	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2696}
P.pygmaea_81	AAATGGAAATTTCATCTTGTGAATCTTTGGCAATCTTATTTTCACTTTTG	{2668}
P.pseudopygmaea_205	AAATGGAAATTTCATCTTGTGAATCTTTGGCAATCTTATTTTCACTTTTG	{2667}
P.vitellina_57	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2686}
P.glauca_176	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2718}
P.ionocentra_46	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2682}
P.prismatocarpa_19	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2632}
P.ochracea_95	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2619}
P.cretacea_230	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2663}
E.luteorosea_178	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2638}
E.luteorosea_173	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2635}
E.subulatifolia_128	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATATTATTTTCACTTTTG	{2658}
E.subulatifolia_174	AAATGGAAATTTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2703}
E.cyanocolumna_1001	AAATGGAAATCTCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2668}
E.tenuissima_143	AAATGGAAATATCATCTTGTGAATTTTTGGCAATCTTATTTTCACTTTTG	{2449}

Appendix G—continued.

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{                                                3460      3470      3480      3490      3500}
{                                                   .         .         .         .         .}
Restrepiella_291             GTTTCAACCTTATAGGATCCATATAAAGCAATTAACGAACTATTCTTTCT   {2886}
Pluer.racemiflora_140        GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCTTTCT   {2855}
Ponera.striata_197           GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2822}
Isochilis.major_279          GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2951}
Epi.ibaguense_60             GTTTCAACCTTATAGGATCCATATAAAACAATTACTCAACTATTCCTTCT   {2751}
Epi.conopseum_244            GTTTCAACCTTATAGGATCCATATAAAGCAATTACTCAACTATTCCTTCT   {2662}
Nidema.boothii_192           GTTTCAACCTTCTAGGATTCATATAAAGCAATTACCCAACTATTCCTTCT   {2693}
S._pulchella_W208            GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAGCTATTCCTTCT   {2709}
H.imbricata_283              GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2727}
Reichenbachanthus_W107       GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2605}
Hexadesmia_K336              GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2706}
Acrorchis_399                GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2713}
Jacquiniella_313             GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2721}
Hagsatera_229                GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2732}
Homalopetalum_234            GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2687}
Meiracyllium_trinas_129      GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2706}
Psy.mcconnelliae_W53R        GTTTCAACCTTATAGGATCCATATCAAGCAATTACCCAACTATTCCTTCT   {2674}
Psy.krugii_62                GTTTCAACCTTATAGGATCCATATCAAGCAATTACCCAACTATTCCTTCT   {2685}
Brough.nigrilensis_152       GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2683}
Tetramica.elegans_160        GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2733}
Domingoa_225                 GTTTCAACCTTATAGGATCTATATAAAGCAATTACCCAACTATTCCTTCT   {2691}
Cattleyopsis_251             GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2697}
Brassav.cucullata_130        GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTAT   {2717}
L.rubescens_W284             GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2703}
Myrmecophila_281             GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2693}
C.dowiana_282                GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2647}
Rhy.glauca_N134              GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2709}
C.forbesii_59                GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2585}
Soph.cernua_145              GTTTCAACCTTATAGGATCCATATAAAGGAATTACCCAACTATTCCTTCT   {2696}
L.purpurata_84               GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2715}
Schm.splendida_280           GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2710}
E.citrina_54                 GTTTCAACCTTATAGGATTCATATAAAGCAATTACCCAACTATTCCTTAT   {2709}
E.mariae_56                  GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTAT   {2723}
E.mariae_87                  GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTAT   {2718}
D.polybulbon_61              GTTTCAACCTTATAGGATTCATATAAAGCAATTACCCAACTATTCCTTCT   {2675}
D.polybulbon_94              GTTTCAACCTTATAGGATTCATATAAAGCAATTACCCAACTATTCCTTCT   {2708}
E.adenocaula_12              GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2672}
E.bractescens_21             GTTTCAACCTTATAGGATTCATATAAAGCAATTACCCAACTATTCCTTCT   {2709}
E.aromatica_02               GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2741}
E.cordigera_24               GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2738}
E.tampensis_27               GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2699}
E.tampensis_alba_23          GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2712}
E.dichroma_74                GTTTCAACCTTATAGGATCCATAKAAAGCAATTACCCAACTATTCCTTCT   {2634}
E.diurna_09                  GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2725}
E.asperula_65                GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2725}
E.candollei_29               GTTTCAACCTTATAGGATCCATAGAAAGCAATTACCCAACTATTCCTTCT   {2644}
E.randii_50                  GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2702}
E.kienastii_235              GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2725}
P.chimborazoensis_51         GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2686}
P.fragrans_172               GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2711}
P.aemula_17                  GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2719}
P.cochleata_31               GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2746}
P.pygmaea_81                 GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2718}
P.pseudopygmaea_205          GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2717}
P.vitellina_57               GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2736}
P.glauca_176                 GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2768}
P.ionocentra_46              GTTTCAACCTTATAGGATCCATATAAAGCAATTACCTAACTATTCCTTCT   {2732}
P.prismatocarpa_19           GTTTCAACCTTATAGGATCCATATAAAGCAATTACCTAACTATTCCTTCT   {2682}
P.ochracea_95                GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2669}
P.cretacea_230               GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2713}
E.luteorosea_178             GTTTCAACCTTCTAGGATCCATATAAATCAATTACCCAACTATTCCTTCT   {2688}
E.luteorosea_173             GTTTCAACCTTCTAGGATCCATATAAATCAATTACCCAACTATTCCTTCT   {2685}
E.subulatifolia_128          GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2708}
E.subulatifolia_174          GTTTCAACCTTATAGGATCCGTATAAAGCAATTACCTAACTATTCCTTCT   {2753}
E.cyanocolumna_1001          GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2718}
E.tenuissima_143             GTTTCAACCTTATAGGATCCATATAAAGCAATTACCCAACTATTCCTTCT   {2499}
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Appendix G—continued.

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{                                               3510      3520      3530      3540      3550}
{                                                  .         .         .         .         .}
Restrepiella_291               CTTTTCTGGGGTATTTTTCAAGTGTA------CGAAAA-AATCCTTTGGT   {2929}
Pluer.racemiflora_140          CTTTTCTGGGGTATTTTTCAAGTGTA------CGAAAA-AATCCTTTGGT   {2898}
Ponera.striata_197             TTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTTGT   {2865}
Isochilis.major_279            CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAA-AACTACTTTGGT   {2994}
Epi.ibaguense_60               CTTTTCTGGGATATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2794}
Epi.conopseum_244              CTTTTCTGGGATATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2705}
Nidema.boothii_192             CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCATTTGAT   {2736}
S._pulchella_W208              CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2752}
H.imbricata_283                CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2770}
Reichenbachanthus_W107         CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2648}
Hexadesmia_K336                CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2749}
Acrorchis_399                  CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2756}
Jacquiniella_313               CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2764}
Hagsatera_229                  CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2775}
Homalopetalum_234              CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2730}
Meiracyllium_trinas_129        CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2749}
Psy.mcconnelliae_W53R          CTTTTCTAGGGTATTTTTCAAGTGTAAGTGTACTAAAA-AATCATTTGAT   {2723}
Psy.krugii_62                  CTTTTCTAGGGTATTTTTCAAGTGTAAGTGTACTAAAA-AATCATTTGAT   {2734}
Brough.nigrilensis_152         CTTTTCTGGGGTATTTTTCAAGTGTAAGTGTACTAAAA-AATCATTTGAT   {2732}
Tetramica.elegans_160          CTTTTCTGGGGTATTTTTCAAGTGTAAGTGTACTAAAA-AATCATTTGAT   {2782}
Domingoa_225                   CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2734}
Cattleyopsis_251               CTTTTCTGGGGTATTTTTCAAGTGTAAGTGTACTAAAA-AATCATTTGAT   {2746}
Brassav.cucullata_130          CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2760}
L.rubescens_w284               CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2746}
Myrmecophila_281               CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCATTTGAT   {2736}
C.dowiana_282                  CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2690}
Rhy.glauca_N134                CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2752}
C.forbesii_59                  CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2628}
Soph.cernua_145                CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2739}
L.purpurata_84                 CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2758}
Schm.splendida_280             CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2753}
E.citrina_54                   CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2752}
E.mariae_56                    CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTYGAT   {2766}
E.mariae_87                    CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTCGAT   {2761}
D.polybulbon_61                CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCATTTGAT   {2718}
D.polybulbon_94                CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCATTTGAT   {2751}
E.adenocaula_12                CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2715}
E.bractescens_21               CTTTTCTGGGGTATTTTTCAATTGTA------CTAAAA-AATCCTTTGAT   {2752}
E.aromatica_02                 CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCATTTGAT   {2784}
E.cordigera_24                 CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2781}
E.tampensis_27                 CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAA-GAATCCTTTGAT   {2742}
E.tampensis_alba_23            CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAA-GAATCCTTTGAT   {2755}
E.dichroma_74                  CTTTTCTGGGGTMTTTTTCAAGTGTA------CTAAAA-AATCCTTTGRT   {2677}
E.diurna_09                    CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2768}
E.asperula_65                  CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2768}
E.candollei_29                 CTTTTCTGGGGTCTTTTTCAAGTGTA------CTAAAA-AATCCTTTGGT   {2687}
E.randii_50                    CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2745}
E.kienastii_235                CTTCTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2768}
P.chimborazoensis_51           CTTTTCTGGGGTATTTTTCAAATGTA------CTAAAAGAATCCTTTGAT   {2730}
P.fragrans_172                 CTTTTCTGGGGTATTTTTCAAATGTA------CAAAA-GAATCCTTTGAT   {2754}
P.aemula_17                    CTTTTCTGGGGTATTTTTCAAATGTA------CAAAA-GAATCCTTTGAT   {2762}
P.cochleata_31                 CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2789}
P.pygmaea_81                   CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2761}
P.pseudopygmaea_205            CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2760}
P.vitellina_57                 CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2779}
P.glauca_176                   CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2811}
P.ionocentra_46                CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2775}
P.prismatocarpa_19             CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2725}
P.ochracea_95                  CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2712}
P.cretacea_230                 CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2756}
E.luteorosea_178               CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2731}
E.luteorosea_173               CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2728}
E.subulatifolia_128            CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2751}
E.subulatifolia_174            CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATMCTTTAGT   {2796}
E.cyanocolumna_1001            CTTTTCTGGGGTATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2761}
E.tenuissima_143               CTTTTCTGGGATATTTTTCAAGTGTA------CTAAAA-AATCCTTTGAT   {2542}
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Appendix G—continued.

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{                                      3560      3570      3580      3590      3600}
{                                         .         .         .         .         .}
Restrepiella_291             AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATATTCTAACTA    {2979}
Pluer.racemiflora_140        AGTAAGAAATCAAATGCTAGAGAATTCATTTATAATAAATGCTCTGACTA    {2948}
Ponera.striata_197           AGTAAGAAATCAAATGTTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2915}
Isochilis.major_279          AGTAAGAAATCAAATGTTAGAGAATTCATTTCTAATAAATACTCTGACTA    {3044}
Epi.ibaguense_60             AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATTCTTTGACTA    {2844}
Epi.conopseum_244            AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTTTGACTA    {2755}
Nidema.boothii_192           AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2786}
S._pulchella_W208            AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2802}
H.imbricata_283              AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2820}
Reichenbachanthus_W107       AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2698}
Hexadesmia_K336              AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2799}
Acrorchis_399                AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2806}
Jacquiniella_313             AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2814}
Hagsatera_229                AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2825}
Homalopetalum_234            AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAACTACTCTGACTA    {2780}
Meiracyllium_trinas_129      AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAAGACTCTGACTA    {2799}
Psy.mcconnelliae_W53R        AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2773}
Psy.krugii_62                AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2784}
Brough.nigrilensis_152       AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2782}
Tetramica.elegans_160        AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2832}
Domingoa_225                 AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2784}
Cattleyopsis_251             AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2796}
Brassav.cucullata_130        AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTTTGACTA    {2810}
L.rubescens_w284             AGTAAAAAATCAAATGTTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2796}
Myrmecophila_281             AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTTTGACTA    {2786}
C.dowiana_282                AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2740}
Rhy.glauca_N134              AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2802}
C.forbesii_59                AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2678}
Soph.cernua_145              AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2789}
L.purpurata_84               AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2808}
Schm.splendida_280           AGTAAGAAATCAAATGTTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2803}
E.citrina_54                 AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2802}
E.mariae_56                  AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2816}
E.mariae_87                  AGTAAGWAATCAAAYGCTAGAGAATTCATTTCTAMTAAATACTCTAACTA    {2811}
D.polybulbon_61              AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2768}
D.polybulbon_94              AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2801}
E.adenocaula_12              AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2765}
E.bractescens_21             AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2802}
E.aromatica_02               AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2834}
E.cordigera_24               AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2831}
E.tampensis_27               AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2792}
E.tampensis_alba_23          AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2805}
E.dichroma_74                AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2727}
E.diurna_09                  AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2818}
E.asperula_65                AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2818}
E.candollei_29               AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2737}
E.randii_50                  AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2795}
E.kienastii_235              AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2818}
P.chimborazoensis_51         AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2780}
P.fragrans_172               AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2804}
P.aemula_17                  AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2812}
P.cochleata_31               AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2839}
P.pygmaea_81                 AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2811}
P.pseudopygmaea_205          AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2810}
P.vitellina_57               AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATATTCTAACTA    {2829}
P.glauca_176                 AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2861}
P.ionocentra_46              AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2825}
P.prismatocarpa_19           AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2775}
P.ochracea_95                AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2762}
P.cretacea_230               AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2806}
E.luteorosea_178             AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2781}
E.luteorosea_173             AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2778}
E.subulatifolia_128          AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2801}
E.subulatifolia_174          AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTGACTA    {2846}
E.cyanocolumna_1001          AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATATTCTAACTA    {2811}
E.tenuissima_143             AGTAAGAAATCAAATGCTAGAGAATTCATTTCTAATAAATACTCTAACTA    {2592}
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Appendix G—continued.

{	3610 3620 3630 3640 3650	}
{	. . . . .	}
Restrepiella_291	AGAAATTAGATACCATAGTCCCAGCTATTTCTCTTATTGGATCATTGTCG	{3029}
Pluer.racemiflora_140	ATAAATTAGATAGCATAGTCCCAGCTATTTCTCTTATTGGATCATTGTCG	{2998}
Ponera.striata_197	AGAAATTAGATACCATAGCCCCAGTTATTTCTCTTATTGGATCATTGTCG	{2965}
Isochilis.major_279	AGAAATTAGATACCATAGCCCCAGTTATTTCTCTTATTGGATCATTGTCG	{3094}
Epi.ibaguense_60	AGAAATTAGATACTAAAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2894}
Epi.conopseum_244	AGAAATTAGATACTATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2805}
Nidema.boothii_192	AGAAATTAGATACCATAGTCCCGGTTATTTCTATTATTGGATCATTGTCG	{2836}
S._pulchella_W208	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2852}
H.imbricata_283	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2870}
Reichenbachanthus_W107	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2748}
Hexadesmia_K336	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2849}
Acrorchis_399	AGAAATTARATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2856}
Jacquiniella_313	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2864}
Hagsatera_229	AGAAATTAGATACCATAGCCCCGGTTATTTMTATTATTGGATCATTGTCG	{2875}
Homalopetalum_234	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2830}
Meiracyllium_trinas_129	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2849}
Psy.mcconnelliae_W53R	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCA	{2823}
Psy.krugii_62	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCA	{2834}
Brough.nigrilensis_152	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2832}
Tetramica.elegans_160	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2882}
Domingoa_225	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2834}
Cattleyopsis_251	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2846}
Brassav.cucullata_130	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2860}
L.rubescens_w284	AGAAATTAGATACCATAGTCCCGGTTATTTCTATTATTGGATCATTGTCG	{2846}
Myrmecophila_281	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2836}
C.dowiana_282	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2790}
Rhy.glauca_N134	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2852}
C.forbesii_59	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2728}
Soph.cernua_145	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2839}
L.purpurata_84	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCGTTGTCG	{2858}
Schm.splendida_280	AGAAATTAGATACCATAGCCCCAGTTATTTCTATTATTGGATCATTGTCG	{2853}
E.citrina_54	ATAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2852}
E.mariae_56	ATAAATTAGTTACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2866}
E.mariae_87	ATAAATTAGTTACCATAGCCCCAGTTATATCTATTATTGGATCATTGTCG	{2861}
D.polybulbon_61	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2818}
D.polybulbon_94	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2851}
E.adenocaula_12	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2815}
E.bractescens_21	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2852}
E.aromatica_02	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2884}
E.cordigera_24	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2881}
E.tampensis_27	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2842}
E.tampensis_alba_23	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2855}
E.dichroma_74	AGAAATTAGATACCATAGCCCCAGTTATTTCTCTTATTGGATCATTGTCG	{2777}
E.diurna_09	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2868}
E.asperula_65	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2868}
E.candollei_29	AGAAATTAGATACCATAGCCCCAGTTATTTCTCTTATTGGATCATTGTCG	{2787}
E.randii_50	AGAAATTAGATACCATAGCCCCAGTTATTTCTATTATTGGATCATTGTCG	{2845}
E.kienastii_235	ATAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2868}
P.chimborazoensis_51	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2830}
P.fragrans_172	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2854}
P.aemula_17	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2862}
P.cochleata_31	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCA	{2889}
P.pygmaea_81	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCA	{2861}
P.pseudopygmaea_205	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCA	{2860}
P.vitellina_57	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2879}
P.glauca_176	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2911}
P.ionocentra_46	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2875}
P.prismatocarpa_19	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2825}
P.ochracea_95	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2812}
P.cretacea_230	AGAAATTAGATACCACAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2856}
E.luteorosea_178	AGAAATTAGATACCATAGACCCGGTTATTTCTATTATGGGATCATTGTCT	{2831}
E.luteorosea_173	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATGGGATCATTGTCT	{2828}
E.subulatifolia_128	AGAAATTAGATACCATAGCCCCGGTTCTTTCTATTATTGGATCATTGTCG	{2851}
E.subulatifolia_174	AGAAATTAGATACCATAGTCCCAGTTCTTTATATTATTGGATCATTGTCG	{2896}
E.cyanocolumna_1001	AGAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2861}
E.tenuissima_143	ATAAATTAGATACCATAGCCCCGGTTATTTCTATTATTGGATCATTGTCG	{2642}

Appendix G—continued.

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{                                                         3660      3670      3680      3690      3700}
{                                                            .         .         .         .         .}
Restrepiella_291                AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {3079}
Pluer.racemiflora_140           AAAGCTAAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {3048}
Ponera.striata_197              AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCCATCTG    {3015}
Isochilis.major_279             AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCAATCTG    {3144}
Epi.ibaguense_60                AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2944}
Epi.conopseum_244               AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCAATCTG    {2855}
Nidema.boothii_192              AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2886}
S._pulchella_W208               AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2902}
H.imbricata_283                 AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2920}
Reichenbachanthus_W107          AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2798}
Hexadesmia_K336                 AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2899}
Acrorchis_399                   AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2906}
Jacquiniella_313                AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2914}
Hagsatera_229                   AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2925}
Homalopetalum_234               AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCAATCTG    {2880}
Meiracyllium_trinas_129         AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2899}
Psy.mcconnelliae_W53R           AAAGCTAAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2873}
Psy.krugii_62                   AAAGCTAAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2884}
Brough.nigrilensis_152          AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2882}
Tetramica.elegans_160           AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2932}
Domingoa_225                    AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2884}
Cattleyopsis_251                AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2896}
Brassav.cucullata_130           AAAGCTCAATTTTGTACTGTATTGGGTCATCCAATTAGTAAACCGATCTG    {2910}
L.rubescens_w284                AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2896}
Myrmecophila_281                AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2886}
C.dowiana_282                   AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTACTAAACCGATCTG    {2840}
Rhy.glauca_N134                 AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2902}
C.forbesii_59                   AAAGCTAAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2778}
Soph.cernua_145                 AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2889}
L.purpurata_84                  AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2908}
Schm.splendida_280              AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2903}
E.citrina_54                    AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2902}
E.mariae_56                     AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2916}
E.mariae_87                     AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2911}
D.polybulbon_61                 AAAGCTCAATTTTGTACTGTGTTGGGTCATCCTATTAGTAAATCGATCTG    {2868}
D.polybulbon_94                 AAAGCTCAATTTTGTACTGTGTTGGGTCATCCTATTAGTAAATCGATCTG    {2901}
E.adenocaula_12                 AAAGCTCAATTTTGTACTGTATTTGGTCATCCTATTAGTAAACCGATCTG    {2865}
E.bractescens_21                AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2902}
E.aromatica_02                  AAAGCTCAATTTTGTACTGTATTTGGTCATCCTATTAGTAAACCGATCTG    {2934}
E.cordigera_24                  AAAGCTCAATTTTGTACTGTATTTGGTCATCCTATTAGTAAACCGATCTG    {2931}
E.tampensis_27                  AAAGCTCAATTTTGTACTGTATTTGGTCATCCTATTAGTAAACCGATCTG    {2892}
E.tampensis_alba_23             AAAGCTCAATTTTGTACTGTATTTGGTCATCCTATTAGTAAACCGATCTG    {2905}
E.dichroma_74                   AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2827}
E.diurna_09                     AAAGCTCAATTTTGTACTGTATTTGGTCATCCTATTAGTAAACCGATCTG    {2918}
E.asperula_65                   AAAGCTCAATTTTGTACTGTATTTGGTCATCCTATTAGTAAACCGATCTG    {2918}
E.candollei_29                  AAAGCTAAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2837}
E.randii_50                     AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2895}
E.kienastii_235                 AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2918}
P.chimborazoensis_51            AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2880}
P.fragrans_172                  AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2904}
P.aemula_17                     AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2912}
P.cochleata_31                  AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2939}
P.pygmaea_81                    AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2911}
P.pseudopygmaea_205             AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2910}
P.vitellina_57                  AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2929}
P.glauca_176                    AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2961}
P.ionocentra_46                 AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2925}
P.prismatocarpa_19              AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2875}
P.ochracea_95                   AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2862}
P.cretacea_230                  AACGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2906}
E.luteorosea_178                AAAGCTAAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2881}
E.luteorosea_173                AAAGCTAAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2878}
E.subulatifolia_128             AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2901}
E.subulatifolia_174             AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2946}
E.cyanocolumna_1001             AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCAATCTG    {2911}
E.tenuissima_143                AAAGCTCAATTTTGTACTGTATTGGGTCATCCTATTAGTAAACCGATCTG    {2692}
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Appendix G—continued.

{	3710 3720 3730 3740 3750}	
{	. . . . .}	
Restrepiella_291	GACCGATTTATCGGATTCTGATATTCTTGATCGATTTTGTCGGATATGTA	{3129}
Pluer.racemiflora_140	GACCGATTTATCGGATTCTGATATTCTTGATCGATTTTGCCGGATATGTA	{3098}
Ponera.striata_197	GACCGATTTATCGGATTCTGATATTCTTGATCGATTTTGTCGGATATGTA	{3065}
Isochilis.major_279	GACCGATTTATCGGATTCTGATATTCTTGATCGATTTTGTCGGATATGTA	{3194}
Epi.ibaguense_60	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCAGATATGTA	{2994}
Epi.conopseum_244	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2905}
Nidema.boothii_192	GACCAATTTATCGGATTCTGATATTCTTGATAAATTTTGTCGGATATGTA	{2936}
S._pulchella_W208	GACCAATTTATCGGATTCTGATATTCTTGATCGATTTTGTCGGATATGTA	{2952}
H.imbricata_283	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGAATATGTA	{2970}
Reichenbachanthus_W107	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2848}
Hexadesmia_K336	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2949}
Acrorchis_399	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2956}
Jacquiniella_313	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2964}
Hagsatera_229	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2975}
Homalopetalum_234	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGAATATGTA	{2930}
Meiracyllium_trinas_129	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCSGATATGTA	{2949}
Psy.mcconnelliae_W53R	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2923}
Psy.krugii_62	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2934}
Brough.nigrilensis_152	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2932}
Tetramica.elegans_160	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2982}
Domingoa_225	GACCAATTTATCGGATTCTTATATTCTTGATCAATTTTGTCGGATATGTA	{2934}
Cattleyopsis_251	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2946}
Brassav.cucullata_130	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2960}
L.rubescens_w284	GACCTATTTATCGGATTCTGATATTCTTGATCGATTTTGTCGGATATGTA	{2946}
Myrmecophila_281	GACCAATTTATCGGATTATGATATTCTTGATCAATTTTGTCGGATATGTA	{2936}
C.dowiana_282	GACCAATTTATCGGATTCTGATATTCTTGATCMATTTTGTCGGATATGTM	{2890}
Rhy.glauca_N134	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2952}
C.forbesii_59	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2828}
Soph.cernua_145	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2939}
L.purpurata_84	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2958}
Schm.splendida_280	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2953}
E.citrina_54	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2952}
E.mariae_56	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2966}
E.mariae_87	GACCGATTTATCGGATTCTGATATTCTTGATCGATTTTGTCGGATATGTA	{2961}
D.polybulbon_61	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2918}
D.polybulbon_94	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2951}
E.adenocaula_12	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2915}
E.bractescens_21	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2952}
E.aromatica_02	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2984}
E.cordigera_24	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2981}
E.tampensis_27	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2942}
E.tampensis_alba_23	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2955}
E.dichroma_74	GACCGATTTATCGGATTCTGATATTCTTGATCGATTTTGTCGGATATGTA	{2877}
E.diurna_09	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2968}
E.asperula_65	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2968}
E.candollei_29	GACCGATTTATCGGATTCTGATATTCTTGATCGATTTTGTCGGATATGTA	{2887}
E.randii_50	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2945}
E.kienastii_235	GACTAATTTATCGGATTCTTATATTCTTGATCAATCTTGTCGGATATGTA	{2968}
P.chimborazoensis_51	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2930}
P.fragrans_172	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2954}
P.aemula_17	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2962}
P.cochleata_31	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2989}
P.pygmaea_81	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2961}
P.pseudopygmaea_205	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2960}
P.vitellina_57	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2979}
P.glauca_176	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{3011}
P.ionocentra_46	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2975}
P.prismatocarpa_19	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2925}
P.ochracea_95	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2912}
P.cretacea_230	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2956}
E.luteorosea_178	GACCAATTTATCGGATTCTTATATTCTTGATCAATTTTGTCGGATATGTA	{2931}
E.luteorosea_173	GACCAATTTATCGGATTCTTATATTCTTGATCAATTTTGTCGGATATGTA	{2928}
E.subulatifolia_128	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2951}
E.subulatifolia_174	GACCGATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2996}
E.cyanocolumna_1001	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2961}
E.tenuissima_143	GACCAATTTATCGGATTCTGATATTCTTGATCAATTTTGTCGGATATGTA	{2742}

Appendix G—continued.

{	3760 3770 3780 3790 3800	}
{	. . . . .	}
Restrepiella_291	GAAATCTTTGTCGTTATCACAGTGGATCCTCAAAGAAACAGGTTTTGTAT	{3179}
Pluer.racemiflora_140	GAAATCTTTGTCGTTATCACAGCGGATCCTCTAAGAAACAGGTTTTATAT	{3148}
Ponera.striata_197	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3115}
Isochilis.major_279	GAAATATTTGTCGTTATCACAGCGGATCCTCAAATAAACAGGTTTTGTAT	{3244}
Epi.ibaguense_60	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3044}
Epi.conopseum_244	GAAATCTTTGTCGTTATCACAGTGGATCCTCAAAGAAACAGGTTTTGTAT	{2955}
Nidema.boothii_192	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2986}
S._pulchella_W208	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3002}
H.imbricata_283	AAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3020}
Reichenbachanthus_W107	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2898}
Hexadesmia_K336	GAAATCTTTGTCGTTATCACAGTGGATCCTCAAAGAAACAGGTTTTGTAT	{2999}
Acrorchis_399	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3006}
Jacquiniella_313	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3014}
Hagsatera_229	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3025}
Homalopetalum_234	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2980}
Meiracyllium_trinas_129	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2999}
Psy.mcconnelliae_W53R	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2973}
Psy.krugii_62	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2984}
Brough.nigrilensis_152	GAAATCTTTGTCATTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2982}
Tetramica.elegans_160	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3032}
Domingoa_225	GCAATCTTTGTCATTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2984}
Cattleyopsis_251	GAAATCTTTGTCGTTATCACAGTGGATCCTCAAAGAAACAGGTTTTGTAT	{2996}
Brassav.cucullata_130	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3010}
L.rubescens_w284	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2996}
Myrmecophila_281	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2986}
C.dowiana_282	GAAATCTTTGTCGTWATCACAGCGGATCYTCAAAGAAACMGGTTTTGTAT	{2940}
Rhy.glauca_N134	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3002}
C.forbesii_59	TAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2878}
Soph.cernua_145	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2989}
L.purpurata_84	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3008}
Schm.splendida_280	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3003}
E.citrina_54	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3002}
E.mariae_56	GAAATCTTTGTCATTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3016}
E.mariae_87	GAAATCTTTGTCATTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3011}
D.polybulbon_61	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2968}
D.polybulbon_94	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3001}
E.adenocaula_12	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2965}
E.bractescens_21	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3002}
E.aromatica_02	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3034}
E.cordigera_24	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3031}
E.tampensis_27	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2992}
E.tampensis_alba_23	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3005}
E.dichroma_74	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2927}
E.diurna_09	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTCTGTAT	{3018}
E.asperula_65	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3018}
E.candollei_29	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2937}
E.randii_50	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2995}
E.kienastii_235	GAAATCTTTGTCGTTATCACAGTGGATCCTCAAAGAAACAGGTTTTGTAT	{3018}
P.chimborazoensis_51	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2960}
P.fragrans_172	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3004}
P.aemula_17	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3012}
P.cochleata_31	GAAATCTTTGTCGTTATCACAGTGGATCCTCAAAGAAACAGGTTTTGTAT	{3039}
P.pygmaea_81	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3011}
P.pseudopygmaea_205	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3010}
P.vitellina_57	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3029}
P.glauca_176	GAAATCTTTGTCATTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3061}
P.ionocentra_46	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3025}
P.prismatocarpa_19	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2975}
P.ochracea_95	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2962}
P.cretacea_230	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3006}
E.luteorosea_178	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2981}
E.luteorosea_173	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{2978}
E.subulatifolia_128	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTGTAT	{3001}
E.subulatifolia_174	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAGCAGGTTTTGTAT	{3046}
E.cyanocolumna_1001	GAAATCTTTGTCGTTATCACAGCGGATCCTCAAAGAAACAGGTTTTATAT	{3011}
E.tenuissima_143	GAAATCTTTGTCGTTATCACAGTGGATCCTCAAAAAAACAGGTTTTGTAT	{2792}

Appendix G—continued.

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{                                           3810      3820      3830      3840      3850}
{                                              .         .         .         .         .}
Restrepiella_291            CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3229}
Pluer.racemiflora_140       CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3198}
Ponera.striata_197          CGTATAAAGTATATACTTCGACTTTCATGTGCTAGAACTTTGGCTCGTAA    {3165}
Isochilis.major_279         CGTATAAAGTATATACTTCGACTTTCATGTGCTAGAACTTTGGCTCGTAA    {3294}
Epi.ibaguense_60            CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3094}
Epi.conopseum_244           CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3005}
Nidema.boothii_192          CGTATAAAGTATATACTTCGACTTTCTTGTGCTAGAACTTTGGCTCGTAA    {3036}
S._pulchella_W208           CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3052}
H.imbricata_283             CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3070}
Reichenbachanthus_W107      CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {2948}
Hexadesmia_K336             CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3049}
Acrorchis_399               CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3056}
Jacquiniella_313            CGTATAAAGTATATACTTCGACTTTCGTGTGCGAGAACTTTGGCTCGTAA    {3064}
Hagsatera_229               CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3075}
Homalopetalum_234           CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3030}
Meiracyllium_trinas_129     CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3049}
Psy.mcconnelliae_W53R       CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGCAA    {3023}
Psy.krugii_62               CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGCAA    {3034}
Brough.nigrilensis_152      CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3032}
Tetramica.elegans_160       CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3082}
Domingoa_225                CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3034}
Cattleyopsis_251            CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3046}
Brassav.cucullata_130       CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3060}
L.rubescens_w284            CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3046}
Myrmecophila_281            CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3036}
C.dowiana_282               CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {2990}
Rhy.glauca_N134             CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3052}
C.forbesii_59               CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {2928}
Soph.cernua_145             CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3039}
L.purpurata_84              CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3058}
Schm.splendida_280          CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3053}
E.citrina_54                CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3052}
E.mariae_56                 CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3066}
E.mariae_87                 CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3061}
D.polybulbon_61             CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3018}
D.polybulbon_94             CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3051}
E.adenocaula_12             CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3015}
E.bractescens_21            CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3052}
E.aromatica_02              CGTATAAAGTATATACTTCGGCTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3084}
E.cordigera_24              CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3081}
E.tampensis_27              CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3042}
E.tampensis_alba_23         CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3055}
E.dichroma_74               CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {2977}
E.diurna_09                 CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3068}
E.asperula_65               CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3068}
E.candollei_29              CGTATAAAGTATATACTTCGACTTTCGTGTGCTATAACTTTGGCTCGTAA    {2987}
E.randii_50                 CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3045}
E.kienastii_235             CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3068}
P.chimborazoensis_51        CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3030}
P.fragrans_172              CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3054}
P.aemula_17                 CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3062}
P.cochleata_31              CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3089}
P.pygmaea_81                CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3061}
P.pseudopygmaea_205         CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3060}
P.vitellina_57              CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGGAA    {3079}
P.glauca_176                CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGGAA    {3111}
P.ionocentra_46             CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3075}
P.prismatocarpa_19          CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3025}
P.ochracea_95               CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3012}
P.cretacea_230              CGTATTAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3056}
E.luteorosea_178            CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3031}
E.luteorosea_173            CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3028}
E.subulatifolia_128         CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3051}
E.subulatifolia_174         CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3096}
E.cyanocolumna_1001         CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {3061}
E.tenuissima_143            CGTATAAAGTATATACTTCGACTTTCGTGTGCTAGAACTTTGGCTCGTAA    {2842}
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Appendix G—continued.

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{                                           3860      3870      3880      3890      3900}
{                                              .         .         .         .         .}
Restrepiella_291               ACATAA-AAGTACAGTACGCACTTTTATGCGAAGATTAGGTTCGGGATTC   {3278}
Pluer.racemiflora_140          ACATAA-AAGTACAGTACGCACTTTTATGCGAAGATTAGATTCGGGATTC   {3247}
Ponera.striata_197             ACATAA-AAGTACAGTACGCACTTTTATGCGAAGATTAGGTTCGGGATTC   {3214}
Isochilis.major_279            ACATAA-AAGTACAGTACGCACTTTTATGCGAAGATTAGGTTCGGGATTC   {3343}
Epi.ibaguense_60               ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3143}
Epi.conopseum_244              ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3054}
Nidema.boothii_192             ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3085}
S._pulchella_W208              ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3101}
H.imbricata_283                ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3119}
Reichenbachanthus_W107         ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTGGGTTCGGGATTC   {2997}
Hexadesmia_K336                ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3098}
Acrorchis_399                  ACATAAG-AGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3105}
Jacquiniella_313               ACATAA-AAGTACAGTACGCACTTTTATGCGAAATTTAGGTTCGGGATTC   {3113}
Hagsatera_229                  ACATAA-AAGTACAGTACGCACTTTTATGCAAAAATTAGGTTCGGGATTC   {3124}
Homalopetalum_234              ACATAA-AAGTACAGTACTCACTTTTATGCTAAATTTAGGTTCGGGATTC   {3079}
Meiracyllium_trinas_129        ACATAAGAAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3099}
Psy.mcconnelliae_W53R          ACATAA-AAGTACAGTACGCACTTTTATGCGAAATTTAGGTTCGGGATTC   {3072}
Psy.krugii_62                  ACATAA-AAGTACAGTACGCACTTTTATGCGAAATTTAGGTTCGGGATTC   {3083}
Brough.nigrilensis_152         ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTGGGTTCGGGATTC   {3081}
Tetramica.elegans_160          ACATAA-AAGTACAGTACGCACTTTTATGCGAAATTTAGGTTCGGGATTC   {3131}
Domingoa_225                   ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3083}
Cattleyopsis_251               ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3095}
Brassav.cucullata_130          ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3109}
L.rubescens_w284               ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3095}
Myrmecophila_281               ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3085}
C.dowiana_282                  ACATAA-AAGTACAGWACGCATTTTTATGCGAAAAWTAGGTTCGGGATTC   {3039}
Rhy.glauca_N134                ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3101}
C.forbesii_59                  ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {2977}
Soph.cernua_145                ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3088}
L.purpurata_84                 ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3107}
Schm.splendida_280             ACATAA-AAGTACAGTACGCACTTTTATACGAAAATTAGGTTCGGGATTC   {3102}
E.citrina_54                   ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3101}
E.mariae_56                    ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3115}
E.mariae_87                    ACATAA-AAGTACAGTACGCACTTTTATGCGAAGATTAGGTTCGGGATTC   {3110}
D.polybulbon_61                ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3067}
D.polybulbon_94                ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3100}
E.adenocaula_12                ACATAA-AAGTACAGTACGCACTTTTATGCGAAAGTTAGGTTCGGGATTC   {3064}
E.bractescens_21               ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3101}
E.aromatica_02                 ACATAA-AAGTACAGTACGCACTTTTATGCGAAATTTAGGTTCGGGATTC   {3133}
E.cordigera_24                 ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3130}
E.tampensis_27                 ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3091}
E.tampensis_alba_23            ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3104}
E.dichroma_74                  ACATAA-AAGTACAGTACGCACTTTTATGCGAAGATTAGGTTCGGGATTC   {3026}
E.diurna_09                    ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3117}
E.asperula_65                  ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3117}
E.candollei_29                 ACATAA-AAGTACAGTACGCACTTTTATGCGAAGATTAGGTTCGGGATTC   {3036}
E.randii_50                    ACATAA-RAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3094}
E.kienastii_235                ACATAA-AAGTACAGTACGCACTTTTATGCGAAATTTAGGTTCGGGGTTC   {3117}
P.chimborazoensis_51           ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3079}
P.fragrans_172                 ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3103}
P.aemula_17                    ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3111}
P.cochleata_31                 ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3138}
P.pygmaea_81                   ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3110}
P.pseudopygmaea_205            ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3109}
P.vitellina_57                 ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3128}
P.glauca_176                   ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3160}
P.ionocentra_46                ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3124}
P.prismatocarpa_19             ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3074}
P.ochracea_95                  ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3061}
P.cretacea_230                 ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3105}
E.luteorosea_178               ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGAGATTC   {3080}
E.luteorosea_173               ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGAGATTC   {3077}
E.subulatifolia_128            ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3100}
E.subulatifolia_174            ACATAA-AAGTACAGTACGAACTTTTATGCGAAGATTAGGTTCGGKATTC   {3145}
E.cyanocolumna_1001            ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {3110}
E.tenuissima_143               ACATAA-AAGTACAGTACGCACTTTTATGCGAAAATTAGGTTCGGGATTC   {2891}
```

Appendix G—continued.

{	3910 3920 3930 3940 3950}	
{	. . . . .}	
Restrepiella_291	TTAGAAGAATTTTTTTTGGAAGAAGAAAAATATCTTTCTTTAATCT-TCC	{3327}
Pluer.racemiflora_140	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3296}
Ponera.striata_197	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3263}
Isochilis.major_279	TTAGAAGAATTCTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3392}
Epi.ibaguense_60	TTAGAAGAATCCTTTTTGGAAGAAGAAAAATCTCTTTCTTTAATCT-TCC	{3192}
Epi.conopseum_244	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTTTTTCTTTAATCT-TCC	{3103}
Nidema.boothii_192	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3134}
S._pulchella_W208	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTATTTAATCT-TCG	{3150}
H.imbricata_283	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3168}
Reichenbachanthus_W107	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3046}
Hexadesmia_K336	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3147}
Acrorchis_399	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTCATCT-TCC	{3154}
Jacquiniella_313	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTCATCT-TCC	{3162}
Hagsatera_229	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3173}
Homalopetalum_234	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3128}
Meiracyllium_trinas_129	TTAGAAGAATTTTTTTTGGAAGAAGAAAAATCTCTTTCTTTAATCT-TCC	{3148}
Psy.mcconnelliae_W53R	TTAGAAGAATTTTTTTTGGAAGAAAAACAATCTCTTTCTTTAATCT-TCC	{3121}
Psy.krugii_62	TTAGAAGAATTTTTTTTGGAAGAAAAACAATCTCTTTCTTTAATCT-TCC	{3132}
Brough.nigrilensis_152	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATTT-TCC	{3130}
Tetramica.elegans_160	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3180}
Domingoa_225	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3132}
Cattleyopsis_251	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3144}
Brassav.cucullata_130	TTAGAAGAATTCTTCTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3158}
L.rubescens_w284	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3144}
Myrmecophila_281	TTAGAAGAATTTTTTTTGGAAGAAGAACA-TCTCTTTCTTTAATCT-TCC	{3133}
C.dowiana_282	TTAGAAGAATTTTTTTTGGAAGAAGAACA-TCTCTTTCTTTCATCT-TCC	{3087}
Rhy.glauca_N134	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3150}
C.forbesii_59	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTCATCT-TCC	{3026}
Soph.cernua_145	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTCATCT-TCG	{3137}
L.purpurata_84	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTCATCT-TCC	{3156}
Schm.splendida_280	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3151}
E.citrina_54	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3150}
E.mariae_56	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3164}
E.mariae_87	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3159}
D.polybulbon_61	TTAGAAGAATTCTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3116}
D.polybulbon_94	TTAGAAGAATTCTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3149}
E.adenocaula_12	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3113}
E.bractescens_21	TTAGAAGAATTCTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3150}
E.aromatica_02	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3182}
E.cordigera_24	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3179}
E.tampensis_27	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3140}
E.tampensis_alba_23	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCTCTCC	{3154}
E.dichroma_74	TTAGAAGAATCTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3075}
E.diurna_09	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCTCTCC	{3167}
E.asperula_65	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3166}
E.candollei_29	TTAGAAGAATTTTTTTTGGAAGAAGAAAAATCTCTTTCTTTAATCT-TCC	{3085}
E.randii_50	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3143}
E.kienastii_235	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3166}
P.chimborazoensis_51	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3128}
P.fragrans_172	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT--CC	{3151}
P.aemula_17	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3160}
P.cochleata_31	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTCATTT-TCC	{3187}
P.pygmaea_81	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3159}
P.pseudopygmaea_205	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3158}
P.vitellina_57	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATTT-TCC	{3177}
P.glauca_176	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3209}
P.ionocentra_46	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3173}
P.prismatocarpa_19	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3123}
P.ochracea_95	TTAGAAGAATTCTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3110}
P.cretacea_230	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3154}
E.luteorosea_178	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3129}
E.luteorosea_173	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCCTTAATCT-TCC	{3126}
E.subulatifolia_128	TTAGAAGGATTCTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3149}
E.subulatifolia_174	TTAGAAGAATTTTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TCC	{3194}
E.cyanocolumna_1001	TTAGAAGAATCCTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TTC	{3159}
E.tenuissima_143	TTAGAAGAATCCTTTTTGGAAGAAGAACAATCTCTTTCTTTAATCT-TTC	{2940}

Appendix G—continued.

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{                                              3960       3970       3980       3990       4000}
{                                                 .          .          .          .          .}
Restrepiella_291                TCCAAAAAATCCCTTTTCTTT--ACACGGATTACATAGAGAACGTATTCG    {3375}
Pluer.racemiflora_140           TTCAAAAAATCCCTTTTCCTTTTACCCGGATTACCATAGAAGAACCGTTA    {3346}
Ponera.striata_197              TCCAAAAAATCCCTTTTCTTTT-ACACGGATTACATAAAGAACGGTATTT    {3312}
Isochilis.major_279             TCCAAAAAATCCCTTTTCTTTT-ACACGAATTACATAAAGAACGTATTGG    {3441}
Epi.ibaguense_60                TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3240}
Epi.conopseum_244               TACAAAAAATCCCTTTTCCTTT-ACACGGATTACATAGAGACGTATTGGT    {3152}
Nidema.boothii_192              TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3182}
S._pulchella_W208               TACAAAAA-TCC-TTTTC-TT--ACACGGATTACATAGAAAACGTATTTG    {3195}
H.imbricata_283                 TACAAAAAATCCCTTTTCCTTT-ACACGGATTACATAGAGACGTATTTGG    {3217}
Reichenbachanthus_W107          TACAAAGAATCCCTTTTCCTTT-ACACGGATTACATAGAGAACGTTTTTG    {3095}
Hexadesmia_K336                 TACAAAAAATCCCTTTTCCTTT-ACACGGATTACATAGAAGG--------    {3188}
Acrorchis_399                   TACAAAAAATCC-TTTTCCTTT-ACACGGATACATAGAGAACGTATTGGT    {3202}
Jacquiniella_313                TACAAAAAATCCCTTTCCTTT--ACACGGATTACATAGAGAACGTATTGG    {3210}
Hagsatera_229                   TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3221}
Homalopetalum_234               TACAAAAA-TCCCTTTTTCTTT-ACACGGATACATAGAGA-CTTTTTGGT    {3175}
Meiracyllium_trinas_129         TACAAAAAATCCCTTTTCCTTT-ACACGGATACTTAAAGA-CGTATTGGT    {3196}
Psy.mcconnelliae_W53R           TACAAAAAATACCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3169}
Psy.krugii_62                   TACAAAAAATACCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3180}
Brough.nigrilensis_152          TACAAAAA-TCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTTTTGGT    {3177}
Tetramica.elegans_160           TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTTTTGGT    {3228}
Domingoa_225                    TACAAAAA-TCCCTTTTTCTTT-ACACGGATACATAGAGA-CGTTTTGGT    {3179}
Cattleyopsis_251                TACAAAAAATCCCTTTTACTTT-ACACGGATTACATAGAGAACGTATTGG    {3193}
Brassav.cucullata_130           TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAAAGA-CGTATTGGT    {3206}
L.rubescens_w284                TACAAAAAATCTCTTTTCCTTT-ACACGGATTACATAGAGAACGTTTTGG    {3193}
Myrmecophila_281                TACAAAAAATCCCTTT-CCTTT-ACACGGATTACATAGAGACGTWTTGGT    {3181}
C.dowiana_282                   TACAGAA--TCCCTTT-CCTTT-ACA------------------------    {3109}
Rhy.glauca_N134                 TACAAAAAATCCCTTTTCCTTT-ACACGGATTACATAAGAACGTATTTGG    {3199}
C.forbesii_59                   TACAAAAAATCC-TTTTCCTTT-ACACGGATTACTTAGAGACGTCTTTGG    {3074}
Soph.cernua_145                 TACAAAAAATCCCTTTTCCTTT-ACACGGATTACATAACGACGTCAATTT    {3186}
L.purpurata_84                  TACAAAAGATCCCTTTTCCTTT-ACACGGATTACATTAAAAGACGTATTT    {3205}
Schm.splendida_280              TACAAAAAATCTCTAATCCTT--ACACGTATTACATAGAGAACGTATTGG    {3199}
E.citrina_54                    TACAAAAAATCCCCTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3198}
E.mariae_56                     TACAAAAAATCCCCTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3212}
E.mariae_87                     TCCAAAAAATCCCTTTCTTTT--ACACGCCTTACATAGAGAA????????    {3207}
D.polybulbon_61                 TACAAAAAATCCCTAATCCTT-GACACGGATACATAGAGA-CGTATTGGT    {3164}
D.polybulbon_94                 TACAAAAAATCCCTTATCCTT-AACACGGATACATAGAGA-CGTATTGGT    {3197}
E.adenocaula_12                 TACAAAGAATCC-TTTTCCTTT-ACACGGATACATAGAGAACGTATTGGT    {3161}
E.bractescens_21                TACAAAAAATACCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3198}
E.aromatica_02                  TACAAAGA-TCCCTTT-CCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3228}
E.cordigera_24                  TACAAAGAATCCC-TTTCCTTT-AC-------------------------    {3202}
E.tampensis_27                  TACAAAGAATCCWTTT-CCTTT-ACACGGATACATAGAGAACGTATTGGT    {3188}
E.tampensis_alba_23             TACAAGAGATCCTTTT-CCTTT-ACACGGATACATAGAGAACGTATTGGT    {3202}
E.dichroma_74                   TMCAAARAATCCCTTTTCCTTT-ACACGGATACATAGAGAACGTATTGGT    {3124}
E.diurna_09                     TACAAGAGATCCTTTT-CCTTT-ACACGGATACATAGAGAACGTATTGGT    {3215}
E.asperula_65                   TACAAAGAATCCTTTT-CCTTT-ACACGGATACATAGAGAACGTATTGGT    {3214}
E.candollei_29                  TCCAAAAAATCC-TTTTC-TTT-ACACGTGATACATAGAGACGTATTGGT    {3132}
E.randii_50                     TACAAARAATCTCTAATCCTTT-ACACGTATTACATAGAGAACGTATTTG    {3192}
E.kienastii_235                 TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3214}
P.chimborazoensis_51            TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3176}
P.fragrans_172                  TACAAAAAATCCCTTTTCCTTT-ACACGGATACTTAGAGA-CGTATTGGT    {3199}
P.aemula_17                     TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3208}
P.cochleata_31                  TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3235}
P.pygmaea_81                    TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAAGAGACGTATTGGT    {3208}
P.pseudopygmaea_205             TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3206}
P.vitellina_57                  TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3225}
P.glauca_176                    TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3257}
P.ionocentra_46                 TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3221}
P.prismatocarpa_19              TACAAAAAATCCCTTTTCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {3171}
P.ochracea_95                   TACAAAAAATCCCTTTTCCTT-AACACGGATACATAGAGA-CGTATTGGT    {3158}
P.cretacea_230                  TACAAAAAATCCCTTTTCCTTT-ACACGGATTACATAGAGACGTATTGGT    {3203}
E.luteorosea_178                TACAAAAAATACCTTTTTCTTT-ACACGGATACATAGAGAACGTATTGGT    {3178}
E.luteorosea_173                TACAAAAAATACCTTTTTCTTT-ACACGGATTACATAGAGACGTATTTGG    {3175}
E.subulatifolia_128             TACAAAAAAT-CCTTTTCTTTT-ACACGGATACATAGAGA-CGTATTGGT    {3196}
E.subulatifolia_174             TCCAAAAAATMCCTTTTMTTTT-MCACGGATACWTAGAGA-CGTATTGGT    {3242}
E.cyanocolumna_1001             TACAAAAAAGACCTTTTCCTTT-ACACGGATTACATAGAGACGTATTTGG    {3208}
E.tenuissima_143                TACAAAAAATCCCTAATCCTTT-ACACGGATACATAGAGA-CGTATTGGT    {2988}
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Appendix G—continued.

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{                                          4010      4020 }
{                                             .         . }
Restrepiella_291            GTATATTGGCC?ATTATCCGG---    {3396}
Pluer.racemiflora_140       TTTGGTATTTGGACCTTTATCCCG    {3370}
Ponera.striata_197          GGTATTTGGACATTATCCGG----    {3332}
Isochilis.major_279         TATTGGACATTACCG---------    {3456}
Epi.ibaguense_60            ATTGG-ACATATCC----------    {3253}
Epi.conopseum_244           ATTGGACATATCCGG---------    {3167}
Nidema.boothii_192          ATTGG-ACATA-------------    {3192}
S._pulchella_W208           GTATTTGGGACATTATCCGG----    {3215}
H.imbricata_283             TATTTGGGACCATTTACCGG----    {3237}
Reichenbachanthus_W107      GGTATTTGGACAT-----------    {3108}
Hexadesmia_K336             ------------------------    {3188}
Acrorchis_399               ATTGGACATATCCGGAA-------    {3219}
Jacquiniella_313            TATTTGGAC?ATTATCCGG-----    {3229}
Hagsatera_229               ATTGG-ACA---------------    {3229}
Homalopetalum_234           ATTGG-ACAT--------------    {3184}
Meiracyllium_trinas_129     ATTGG-ACATATC-----------    {3208}
Psy.mcconnelliae_W53R       ATTGG-------------------    {3174}
Psy.krugii_62               ATTGG-ACAT--------------    {3189}
Brough.nigrilensis_152      ATTGG-ACAT--------------    {3186}
Tetramica.elegans_160       ATTGG-ACATTTTC----------    {3241}
Domingoa_225                ATTGG-ACAT--------------    {3188}
Cattleyopsis_251            TATTGGACATATCCGG--------    {3209}
Brassav.cucullata_130       ATTGG-ACATA-------------    {3216}
L.rubescens_w284            TATTTGGAC??TTATCCGG-----    {3212}
Myrmecophila_281            ATTGGAC-----------------    {3188}
C.dowiana_282               ------------------------    {3109}
Rhy.glauca_N134             TATTTGGAACATTTTCCCGG----    {3219}
C.forbesii_59               TATTTGGACATTATCC--------    {3090}
Soph.cernua_145             GGTATTTTGGACATTTTCCGG---    {3207}
L.purpurata_84              GGTATTTGGACATTATCCGGG---    {3226}
Schm.splendida_280          TATTGGACAG--------------    {3209}
E.citrina_54                ATTGG-ACATATCCCG--------    {3213}
E.mariae_56                 ATTGG-ACGATCTCCCTCCGAT--    {3233}
E.mariae_87                 ????????????????????????    {3231}
D.polybulbon_61             ATTGG-ACATAT------------    {3175}
D.polybulbon_94             ATTGG-ACATAT------------    {3208}
E.adenocaula_12             ATTGGACAT---------------    {3170}
E.bractescens_21            ATTGG-AC----------------    {3205}
E.aromatica_02              ATTGG-ACATATC-----------    {3240}
E.cordigera_24              ------------------------    {3202}
E.tampensis_27              ATTGG-ACAT--------------    {3197}
E.tampensis_alba_23         ATTGG-ACATA-------------    {3212}
E.dichroma_74               ATTTGGACATTATCCGG-------    {3141}
E.diurna_09                 ATTGGGACATA-------------    {3226}
E.asperula_65               ATTGGGAC----------------    {3222}
E.candollei_29              ATTGGAC-----------------    {3139}
E.randii_50                 GTATTTGGACATTATCCGG-----    {3211}
E.kienastii_235             ATTGG-ACATAT------------    {3225}
P.chimborazoensis_51        ATTGG-ACTTATCCCGA-------    {3192}
P.fragrans_172              ATTGG-ACATATCCCG--------    {3214}
P.aemula_17                 ATTGG-A-----------------    {3214}
P.cochleata_31              ATTGG-ACTA--------------    {3244}
P.pygmaea_81                ATTGG-ACTATCCG----------    {3221}
P.pseudopygmaea_205         ATTGG-ACTATCCGG---------    {3220}
P.vitellina_57              ATTGG-ACATATCCC---------    {3239}
P.glauca_176                ATTGG-AC----------------    {3264}
P.ionocentra_46             ATTGG-ACT---------------    {3229}
P.prismatocarpa_19          ATTGG-ACA---------------    {3179}
P.ochracea_95               ATTGG-ACATATC-----------    {3170}
P.cretacea_230              ATTGG-ACATATCCGG--------    {3218}
E.luteorosea_178            ATTGG-ACATTATCG---------    {3192}
E.luteorosea_173            TATTTGGACATTATCCGGC-----    {3194}
E.subulatifolia_128         ATTGG-ACATATCCGG--------    {3211}
E.subulatifolia_174         ATTGG-ACAT--------------    {3251}
E.cyanocolumna_1001         TATTTGGACATTATCCGGA-----    {3227}
E.tenuissima_143            ATTGG-ACATCATCCC--------    {3003}
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Appendix G—continued.

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                                     |<-Start indels
{                                          4030      4040      4050      4060      4070   }
{                                             .         .         .         .         .   }
Restrepiella_291                     0010010000000010010001000000000000000000000000000000
Pluer.racemiflora_140                0010000010000000010000000000000000000001100000101000
Ponera.striata_197                   0000000000001110001100000000110001000000000000000000
Isochilis.major_279                  0000000000001110001001000000000001000000000000000000
Epi.ibaguense_60                     0000000001000001100000001001000000011000000000000000
Epi.conopseum_244                    0000000000000001100000000000000010010000000000000000
Nidema.boothii_192                   0000000000000001100000000000000000000000000001000000
S._pulchella_W208                    0000100000000001100000000000000000000000000000000000
H.imbricata_283                      0000000000000001100000000000000000000000000000000000
Reichenbachanthus_W107               1000000000000001100000000000000100000000000000000000
Hexadesmia_K336                      0000000000000001100000000000000000000000000000000000
Acrorchis_399                        0000000000000001100000000000000000000000000000100000
Jacquiniella_313                     0000000000000001100000000000000000000000000000100000
Hagsatera_229                        0000000000000001100000000000000000000000000000000000
Homalopetalum_234                    0000001000010001100000000000010000000000000000000000
Meiracyllium_trinas_129              0000000000000000100000010000001000000000000000000000
Psy.mcconnelliae_W53R                0000000100000001100000000100000000000000000000000001
Psy.krugii_62                        0000000100000001100000000100000000000000000000000001
Brough.nigrilensis_152               0000000000000001100000000000000000000000000000000001
Tetramica.elegans_160                0000000000000001100000000000000000000000000000000000
Domingoa_225                         0000000000000001100000000000000000000000000000000000
Cattleyopsis_251                     0000000000000001100000100000000000000000000110000001
Brassav.cucullata_130                0000000000000001100000000000000000000000000000000000
L.rubescens_w284                     0000000000000001100000000000000000000000000000000000
Myrmecophila_281                     0000000000000000100000000000000000010000000000000000
C.dowiana_282                        0000000000000001100010000000000000000000000000000000
Rhy.glauca_N134                      0000000000000001100000000000000000000000000000000000
C.forbesii_59                        0000000000000001100000000000000000000000000000000000
Soph.cernua_145                      0000000000000001100000000000000000000001000000000000
L.purpurata_84                       0000000000000000100000000000000000000000000000000000
Schm.splendida_280                   0000000000000001100000000000000000000000000000000000
E.citrina_54                         0000000000000001100000000000000000000000000000000000
E.mariae_56                          0000000000000001100000000000000000000000000000000000
E.mariae_87                          0000000000000001100000000000000000000000000000000000
D.polybulbon_61                      0000000000000001100000000000000000000000000000000000
D.polybulbon_94                      0000000000000001100000000000000000000000000000000000
E.adenocaula_12                      0000000000000001100000000000000000100000001000000000
E.bractescens_21                     0000000000000001100000001000000000100000001000000010
E.aromatica_02                       0000000000000001100000001000000000100000001000000000
E.cordigera_24                       0000000000000001100000000000000000000000001000000000
E.tampensis_27                       0000000000000001100000001000000000100000001000000000
E.tampensis_alba_23                  0000000000000001100000001000000000100000001000000000
E.dichroma_74                        0000000000000001100000001000000000100100001000000100
E.diurna_09                          0000000000000001100000001000000000100000001000000000
E.asperula_65                        0000000000000001100000001000000000100000001000000000
E.candollei_29                       0000000000000001100000001000000000100000001000000100
E.randii_50                          0001000000000001100000001000000000100000001000000000
E.kienastii_235                      0000000000000001100000000000000000000000000000000000
P.chimborazoensis_51                 0100000000000001100000000000000000000000000000000000
P.fragrans_172                       0000000000000001100000000000000000000000000000000000
P.aemula_17                          0000000000000001100000000000000000000000000000000000
P.cochleata_31                       0000000000000001100000000010000000000010000000000000
P.pygmaea_81                         0000000000000001100000000000000000000000010000000000
P.pseudopygmaea_205                  0000000000000001100000000000000000000000010000000000
P.vitellina_57                       0000000000000001100000000000000000000010000000000000
P.glauca_176                         0000000000000001100000000000000000000100000000110000
P.ionocentra_46                      0000000000000001100000000000000000001000000000000000
P.prismatocarpa_19                   0000000000000001100000000000000000000100000000000000
P.ochracea_95                        0000000000000001100000000000000000000000000000000000
P.cretacea_230                       0000000000000001100000000000000000000000000000000000
E.luteorosea_178                     0000000000000001100000000000000000000000000000000000
E.luteorosea_173                     0000000000000001100000000000000000000000000000000000
E.subulatifolia_128                  0000000000000001100000000000000000000000000010000000
E.subulatifolia_174                  0000000000000001100000000000000000000000000010000000
E.cyanocolumna_1001                  0000000000000001100000000000000000000000000000000000
E.tenuissima_143                     0000000000100001100000000000000000000000000000000000
;
```

APPENDIX H
HOLOMORPHOLOGY WEIGHT SET

Weight: Characters
0: 13, 32, 39, 43, 65, 97, 101, 110, 135, 171, 201, 220, 225, 226, 232, 236, 260, 272, 282, 283, 287, 300, 338, 382, 493, 517, 534, 538, 548, 549, 566, 609, 614, 625, 629, 646, 667, 752, 755, 761, 797, 801-804, 811, 860, 863, 864, 885, 887, 1097-1129\16, 1147, 1319, 1618, 1658, 1663, 1664, 1668, 1688, 1765, 1979, 2071, 2099, 2111, 2124, 2178, 2330, 2350, 2354, 2356, 2368, 2399, 2457, 2516, 2523, 2525, 2537, 2641, 2644, 2645, 2650, 2651-2655\2, 2659, 2673, 2690, 2720, 2741, 2747, 2755, 2780, 2835, 2845, 2861, 2918, 3018, 3021, 3065, 3119, 3157, 3191, 3227, 3239, 3245, 3273, 3352, 3473, 3492, 3495, 3674, 3777, 3825, 3855, 3879, 3970, 4010, 4027, 4032, 4038, 4040, 4046, 4047, 4049, 4061, 4128, 4136, 4143-4146
14: 49
16: 1918
22: 67
28: 38, 95, 620, 776, 3994
33: 2642, 2643
35: 36
36: 33, 856
37: 31
38: 3, 6, 57
40: 74, 539, 777, 2079, 3220, 3445, 4039
41: 1231
44: 22
48: 8, 751, 2550
50: 45, 3446
51: 51, 54
53: 12
55: 34, 796
56: 643
57: 522, 734
58: 37, 73
59: 574
61: 19
63: 10, 356, 610, 636, 787, 1982, 3310, 3507, 3845, 4048
65: 136
67: 82, 125, 309, 757, 2824, 3282, 3739, 4051
69: 44
71: 302
73: 555
74: 18, 80
76: 47, 565
77: 71
80: 1748
81: 340, 567
82: 2646
83: 58, 70
86: 279, 360, 642
89: 77
93: 15, 30
99: 17
100: 4, 35, 56, 289, 298, 637, 661, 733, 782, 1710, 1953, 3223, 3684, 3701, 3815, 4043
103: 2
107: 23, 312, 335, 764
105: 200
110: 59
111: 64, 140, 158, 281, 296, 299, 346, 541, 546, 550, 591, 652, 698, 1022, 1057, 1157, 1742, 2116, 2122, 2164, 2255, 2802, 3020, 3254, 3676, 3705, 3802, 3967, 3993, 4153

Appendix H—continued.

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Weight: Characters
112: 41
114: 1111
118: 544
120: 48
121: 758
125: 29, 159, 280, 311
127: 334
132: 20
133: 68, 76, 756
136: 753
138: 7
139: 3678;
143: 63, 146, 324, 354, 525, 982, 3966
147: 108
156: 16, 62, 709
160: 587, 714, 2647, 4034
163: 50
167: 145, 191, 349, 543, 600, 727, 762, 763, 1218, 1826, 2376, 2542, 3185, 3551, 3626
169: 728, 2959
171: 297
182: 651
184: 60
188: 150, 558, 2128
195: 224
196: 61, 69, 2127
200: 244, 259, 329, 1741, 2648, 2817, 3631
203: 2223
205: 759
212: 745
214: 303
222: 2014, 4024
229: 2863, 3787
231: 5
238: 3013
250: 11, 14, 40, 72, 170, 173, 192, 194, 245, 284, 333, 357, 583, 613, 664, 668, 707,
     793, 1030, 1073, 1098, 1186, 1639, 1666, 1955, 2112, 2797, 2823, 2841, 2851, 2915,
     2932, 2963, 2971, 3011, 3050, 3209, 3544, 3593, 4044, 4050, 4121, 4142, 4151
251: 78
255: 2328
259: 2708, 4131
267: 2840
286: 1, 143
294: 52, 3517
300: 55, 310, 582, 1894, 3732
308: 660
333: 81, 149, 195, 317, 575, 616, 712, 2003, 2329, 2484, 2548, 2834, 2993, 3200, 3569,
     3581, 3649, 4158
338: 221
375: 132, 148, 1244, 1852, 2375, 2539, 2649, 2668, 2681, 2752, 3228
360: 746
400: 21, 181, 318, 744, 3715
417: 166, 2933, 3756
423: 1602
429: 147
435: 26
438: 2278
444: 174, 223, 556, 4141
455: 520, 724
458: 27, 42, 154, 2148, 568, 2285, 2868, 3122, 4122
467: 25
500: 177, 2347
571: 53
600: 670, 760, 2468
611: 665
625: 2705
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Appendix H—continued.

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Weight: Characters
1000: 9, 24, 28, 46, 66, 75-83\4, 84-94, 96, 98-100, 102-107, 109, 111-124, 126-131, 133,
      134, 137-139, 141, 142, 144, 151-153, 155-157, 160-165, 167-169, 172, 175, 176,
      178-180, 182-190, 193, 196-199, 202-219, 222, 227-231, 233-235, 237-243, 246-258,
      261-271, 273-278, 285, 286-290\2, 291-295, 301, 304-308, 313-316, 319-323, 325-328,
      330-332, 336, 337-341\2, 342-345, 347, 348, 350-353, 355, 358, 359, 361-381, 383-
      492, 494-516, 518, 519-523\2, 524, 526-533, 535-537, 540, 542, 545, 547, 551-554,
      557, 559-564, 569-573, 576-581, 584-586, 588-590, 592-599, 601-608, 611, 612, 615,
      617-619, 621-624, 626-628, 630-635, 638-641, 644, 645, 647-650, 653-659, 662, 663-
      669\3, 671-697, 699-706, 708, 710, 711-715\2, 716-723, 725, 726, 729-732, 735-743,
      747-750, 754, 765-775, 778-781, 783-786, 788-792, 794, 795, 798-800, 805-810, 812-
      855, 857-859, 861, 862, 865-884, 886, 888-981, 983-1021, 1023-1029, 1031-1056,
      1058-1072, 1074-1096, 1099-1110, 1112, 1114-1128, 1130-1146, 1148-1156, 1158-1185,
      1187-1217, 1219-1230, 1232-1243, 1245-1318, 1320-1601, 1603-1617, 1619-1638, 1640-
      1657, 1659-1662, 1665-1669\2, 1670-1687, 1689-1709, 1711-1740, 1743-1747, 1749-
      1764, 1766-1825, 1827-1851, 1853-1893, 1895-1917, 1919-1952, 1954, 1956-1978, 1980,
      1981, 1983-2002, 2004-2013, 2015-2070, 2072-2078, 2080-2098, 2100-2110, 2113-2115,
      2117-2121, 2123, 2125, 2126, 2129-2147, 2149-2163, 2165-2177, 2179-2222, 2224-2254,
      2256-2277, 2279-2284, 2286-2327, 2331-2346, 2348, 2349, 2351-2353, 2355, 2357-2367,
      2369-2374, 2377-2398, 2400-2456, 2458-2467, 2469-2483, 2485-2515, 2517-2522, 2524,
      2526-2536, 2538, 2540, 2541, 2543-2547, 2549, 2551-2640, 2652-2656\2, 2657, 2658,
      2660-2667, 2669-2672, 2674-2680, 2682-2689, 2691-2704, 2706, 2707, 2709-2719, 2721-
      2740, 2742-2746, 2748-2751, 2753, 2754, 2756-2779, 2781-2796, 2798-2801, 2803-2816,
      2818-2822, 2825-2833, 2836-2839, 2842-2844, 2846-2850, 2852-2860, 2862, 2864-2867,
      2869-2914, 2916, 2917, 2919-2931, 2934-2958, 2960-2962, 2964-2970, 2972-2992, 2994-
      3010, 3012, 3014-3017, 3019, 3022-3049, 3051-3064, 3066-3118, 3120, 3121, 3123-
      3156, 3158-3184, 3186-3190, 3192-3199, 3201-3208, 3210-3219, 3221, 3222, 3224-3226,
      3229-3238, 3240-3244, 3246-3253, 3255-3272, 3274-3281, 3283-3309, 3311-3351, 3353-
      3444, 3447-3472, 3474-3491, 3493, 3494, 3496-3506, 3508-3516, 3518-3543, 3545-3550,
      3552-3568, 3570-3580, 3582-3592, 3594-3625, 3627-3630, 3632-3648, 3650-3673, 3675-
      3679\2, 3680-3683, 3685-3700, 3702-3704, 3706-3714, 3716-3731, 3733-3738, 3740-
      3755, 3757-3776, 3778-3786, 3788-3801, 3803-3814, 3816-3824, 3826-3844, 3846-3854,
      3856-3878, 3880-3965, 3968, 3969, 3971-3992, 3995-4009, 4011-4023, 4025, 4026,
      4028-4031, 4033, 4035-4037, 4041, 4042, 4045, 4052-4060, 4062-4120, 4123-4127,
      4129, 4130, 4132-4135, 4137-4140, 4147-4150, 4152, 4154-4157

excluded = 828-855, 2554-2640, 4063-4106;
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APPENDIX I
PATRISTIC DISTANCE MATRIX

Appendix I—continued.

Below diagonal: Adjusted character distances
Above diagonal: Patristic distances

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Restrepiella 291	-	127	227	219	324	301	273	227	237	234	228	232	236	236
2	Pluer.racemiflor	127	-	236	228	333	310	282	236	246	243	237	241	245	245
3	Ponera.striata 1	217	218	-	70	245	222	194	148	158	155	149	153	157	157
4	Isochilis.major	205	216	70	-	237	214	186	140	150	147	141	145	149	149
5	Epi.ibaguense 60	262	263	193	181	-	65	117	155	165	162	156	160	164	134
6	Epi.conopseum 24	239	244	164	150	65	-	94	132	142	139	133	137	141	111
7	Nidema.boothii 1	243	243	162	161	104	75	-	104	114	111	105	109	113	83
8	S. pulchella W20	215	222	137	132	111	80	74	-	44	41	27	47	51	67
9	H.imbricata 283	219	228	150	142	117	92	79	44	-	35	45	57	61	77
10	Reichenbachanthu	216	223	146	141	114	89	81	37	35	-	42	54	58	74
11	Hexadesmia K336	216	225	143	133	104	73	70	27	43	42	-	48	52	68
12	Acrorchis 399	216	219	143	135	108	81	77	47	49	50	48	-	34	72
13	Jacquiniella 313	214	223	145	135	112	87	81	51	57	56	50	34	-	76
14	Hagsatera 229	222	229	145	137	110	79	68	57	63	62	54	62	64	-
15	Homalopetalum 23	228	235	163	157	122	97	86	73	83	79	72	80	82	73
16	Meiracyllium tri	230	239	165	157	92	73	71	87	93	90	84	84	88	78
17	Psy.mcconnelliae	240	239	163	155	122	95	84	77	85	84	72	82	86	54
18	Psy.krugii 62	236	235	159	151	118	91	80	73	81	80	68	78	82	50
19	Brough.nigrilens	228	231	157	151	114	89	76	73	79	76	66	78	80	48
20	Tetramica.elegan	239	240	158	152	115	88	81	78	88	83	73	77	83	59
21	Domingoa 225	227	222	154	148	113	86	80	68	84	79	65	75	79	63
22	Cattleyopsis 251	234	235	157	151	116	85	72	71	77	78	62	74	80	52
23	Brassav.cucullat	232	237	157	149	108	87	81	73	81	78	72	74	72	56
24	L.rubescens w284	235	238	160	148	107	78	73	70	78	77	63	73	79	45
25	Myrmecophila 281	243	240	162	154	115	90	69	78	86	87	77	81	89	61
26	C.dowiana 282	232	237	161	153	116	89	83	71	81	78	70	74	78	52
27	Rhy.glauca N134	222	229	155	147	100	77	69	61	69	66	60	64	66	40
28	C.forbesii 59	231	231	164	151	120	93	90	76	85	85	70	79	83	54
29	Soph.cernua 145	243	238	166	156	115	86	83	80	86	91	73	85	87	63
30	L.purpurata 84	224	227	151	143	118	89	81	71	81	78	70	74	76	52
31	Schm.splendida 2	229	232	152	142	107	76	75	66	74	75	63	69	75	43
32	E.citrina 54	238	243	167	161	108	79	71	81	93	90	78	82	88	64
33	E.mariae 56	241	247	172	165	114	85	78	86	93	93	84	85	93	70
34	E.mariae 87	232	242	165	158	113	86	77	85	92	92	83	84	86	69
35	D.polybulbon 61	251	252	176	172	105	82	44	84	96	91	79	89	93	77
36	D.polybulbon 94	238	239	163	159	92	69	31	71	83	78	68	76	80	64
37	E.adenocaula 12	241	248	164	154	107	80	69	78	88	85	71	81	87	61
38	E.bractescens 21	247	255	172	157	112	83	76	84	95	93	78	89	95	70
39	E.aromatica 02	247	248	164	154	109	80	71	82	92	89	77	85	91	65
40	E.cordigera 24	246	249	167	155	112	83	76	81	91	88	76	84	90	64
41	E.tampensis 27	239	242	158	148	103	74	65	74	84	81	67	73	83	59
42	E.tampensis alba	239	244	162	150	103	74	65	76	84	85	67	73	83	59
43	E.dichroma 74	243	244	162	158	120	93	84	91	101	99	86	94	102	74
44	E.diurna 09	247	252	166	156	111	84	75	82	92	91	75	83	89	63
45	E.asperula 65	242	248	163	156	109	80	69	77	88	84	71	78	84	61
46	E.candollei 29	256	255	175	169	129	102	93	104	112	113	99	105	115	91
47	E.randii 50	241	242	160	152	103	74	67	76	86	84	69	81	87	61
48	E.kienastii 235	235	240	162	150	107	74	69	72	82	79	67	79	81	55
49	P.chimborazoensi	238	245	171	165	102	87	74	81	91	90	80	88	92	62
50	P.fragrans 172	236	241	167	161	102	81	70	77	89	88	78	86	90	60
51	P.aemula 17	244	247	175	169	106	87	74	85	95	96	86	92	98	68
52	P.cochleata 31	244	249	175	169	106	87	76	87	95	94	84	90	92	68
53	P.pygmaea 81	244	259	175	169	114	85	77	89	99	98	86	92	94	72
54	P.pseudopygmaea	241	256	168	164	111	80	74	84	96	95	81	89	91	69
55	P.vitellina 57	238	251	173	165	110	83	70	83	89	90	78	86	90	64
56	P.glauca 176	243	240	172	164	107	78	71	88	92	93	83	87	93	71
57	P.ionocentra 46	238	243	169	157	102	77	72	81	89	90	78	84	88	60
58	P.prismatocarpa	238	243	171	159	104	79	74	83	91	92	80	86	90	62
59	P.ochracea 95	238	247	171	161	100	77	72	83	91	92	78	86	92	66
60	P.cretacea 230	227	238	160	150	95	66	61	72	78	79	67	77	77	51
61	E.luteorosea 178	240	241	165	159	110	79	70	85	91	90	78	86	94	72
62	E.luteorosea 173	241	242	166	160	111	80	71	86	92	91	79	87	95	73
63	E.subulatifolia	238	243	163	159	92	71	83	87	95	94	82	86	88	88
64	E.subulatifolia	258	261	179	176	122	99	105	113	121	120	108	112	112	113
65	E.cyanocolumna 1	236	239	157	147	100	71	66	79	86	89	74	82	88	64
66	E.tenuissima 143	237	243	160	149	106	75	76	86	93	95	80	87	95	70

Appendix I—continued.

		15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	Restrepiella 291	254	286	260	256	252	265	243	254	268	261	261	254	250	261
2	Pluer.racemiflor	263	295	269	265	261	274	252	263	277	270	270	263	259	270
3	Ponera.striata 1	175	207	181	177	173	186	164	175	189	182	182	175	171	182
4	Isochilis.major	167	199	173	169	165	178	156	167	181	174	174	167	163	174
5	Epi.ibaguense 60	164	102	158	154	150	163	153	152	166	159	159	152	148	159
6	Epi.conopseum 24	141	79	135	131	127	140	130	129	143	136	136	129	125	136
7	Nidema.boothii 1	113	79	107	103	99	112	102	101	115	108	108	101	97	108
8	S. pulchella W20	85	117	91	87	83	96	74	85	99	92	92	85	81	92
9	H.imbricata 283	95	127	101	97	93	106	84	95	109	102	102	95	91	102
10	Reichenbachanthu	92	124	98	94	90	103	81	92	106	99	99	92	88	99
11	Hexadesmia K336	86	118	92	88	84	97	75	86	100	93	93	86	82	93
12	Acrorchis 399	90	122	96	92	88	101	79	90	104	97	97	90	86	97
13	Jacquiniella 313	94	126	100	96	92	105	83	94	108	101	101	94	90	101
14	Hagsatera 229	76	96	60	56	52	65	65	54	68	61	61	54	50	61
15	Homalopetalum 23	-	126	100	96	92	105	63	94	108	101	101	94	90	101
16	Meiracyllium tri	95	-	120	116	112	125	115	114	128	121	121	114	110	121
17	Psy.mcconnelliae	91	96	-	4	42	49	89	44	84	77	77	70	66	77
18	Psy.krugii 62	87	92	4	-	38	45	85	40	80	73	73	66	62	73
19	Brough.nigrilens	81	88	42	38	-	47	81	24	76	69	69	62	58	69
20	Tetramica.elegan	88	89	49	45	47	-	94	49	89	82	82	75	71	82
21	Domingoa 225	63	87	73	69	67	74	-	83	97	90	90	83	79	90
22	Cattleyopsis 251	79	86	44	40	24	45	67	-	78	71	71	64	60	71
23	Brassav.cucullat	83	84	68	64	64	73	73	66	-	73	73	58	34	65
24	L.rubescens w284	76	79	61	57	53	62	62	51	55	-	56	59	55	66
25	Myrmecophila 281	95	93	67	63	63	72	80	63	69	56	-	59	55	66
26	C.dowiana 282	81	86	66	62	58	73	77	58	58	53	57	-	40	39
27	Rhy.glauca N134	67	70	56	52	46	61	61	52	34	39	51	40	-	47
28	C.forbesii 59	89	93	66	62	62	77	76	62	59	59	57	39	47	-
29	Soph.cernua 145	86	89	79	75	69	80	80	67	61	56	70	55	49	61
30	L.purpurata 84	81	84	62	58	54	69	73	54	48	53	53	34	40	35
31	Schm.splendida 2	81	81	57	53	55	62	64	57	55	34	48	49	39	51
32	E.citrina 54	83	76	84	80	72	87	75	78	80	69	91	78	66	85
33	E.mariae 56	88	81	90	86	74	93	78	82	87	73	93	85	73	92
34	E.mariae 87	85	78	89	85	73	92	75	81	86	72	92	84	70	91
35	D.polybulbon 61	90	81	87	83	83	86	82	83	89	82	96	91	77	98
36	D.polybulbon 94	77	68	74	70	70	73	69	70	76	69	83	78	64	85
37	E.adenocaula 12	84	79	77	73	73	78	70	71	79	68	78	75	65	79
38	E.bractescens 21	92	85	80	78	78	85	78	76	87	75	85	81	73	84
39	E.aromatica 02	90	81	79	75	77	82	74	75	87	72	82	77	71	83
40	E.cordigera 24	91	82	80	76	80	83	77	78	86	73	83	76	70	82
41	E.tampensis 27	78	71	75	71	71	70	66	67	81	64	78	75	65	79
42	E.tampensis alba	80	71	77	73	73	72	68	69	81	64	80	77	65	81
43	E.dichroma 74	97	88	89	85	88	89	81	86	98	83	93	92	82	96
44	E.diurna 09	88	81	81	77	77	80	74	75	85	72	82	79	69	83
45	E.asperula 65	81	72	81	77	77	76	71	73	84	70	84	78	68	83
46	E.candollei 29	110	95	101	97	101	102	96	97	111	92	104	103	95	103
47	E.randii 50	84	73	75	71	71	76	66	69	81	60	76	75	65	79
48	E.kienastii 235	88	79	73	69	71	72	70	71	79	66	80	73	63	77
49	P.chimborazoensi	93	82	86	82	82	89	83	86	80	77	91	84	66	84
50	P.fragrans 172	89	78	86	82	82	87	81	84	82	75	91	84	66	84
51	P.aemula 17	93	82	90	86	84	91	83	86	88	77	95	86	72	88
52	P.cochleata 31	97	88	88	84	82	93	89	86	90	81	91	88	72	90
53	P.pygmaea 81	93	80	98	94	90	95	89	92	92	81	101	94	78	97
54	P.pseudopygmaea	88	79	93	89	89	92	84	89	87	78	96	89	73	92
55	P.vitellina 57	89	80	92	88	82	93	83	86	84	73	95	86	70	90
56	P.glauca 176	92	85	91	87	83	92	82	85	89	76	98	89	73	93
57	P.ionocentra 46	93	76	82	78	78	87	81	84	80	71	87	78	64	82
58	P.prismatocarpa	93	78	84	80	80	89	83	86	82	73	87	80	66	82
59	P.ochracea 95	89	78	88	84	84	89	79	86	84	73	95	88	70	92
60	P.cretacea 230	80	69	77	73	71	80	72	75	77	66	84	73	61	77
61	E.luteorosea 178	95	78	86	82	82	87	85	78	94	81	95	86	82	88
62	E.luteorosea 173	96	79	87	83	83	88	86	79	95	82	96	87	83	89
63	E.subulatifolia	94	76	104	100	94	93	85	86	92	89	103	94	86	97
64	E.subulatifolia	118	104	131	127	122	121	111	114	120	117	131	120	114	125
65	E.cyanocolumna 1	93	72	88	84	82	89	85	78	86	77	87	82	78	84
66	E.tenuissima 143	98	79	100	96	92	99	88	86	93	85	97	89	85	90

Appendix I—continued.

		29	30	31	32	33	34	35	36	37	38	39	40	41	42
1	Restrepiella 291	275	254	253	272	280	286	283	271	255	264	261	268	263	263
2	Pluer.racemiflor	284	263	262	281	289	295	292	280	264	273	270	277	272	272
3	Ponera.striata 1	196	175	174	193	201	207	204	192	176	185	182	189	184	184
4	Isochilis.major	188	167	166	185	193	199	196	184	168	177	174	181	176	176
5	Epi.ibaguense 60	173	152	151	124	132	138	127	115	125	134	131	138	133	133
6	Epi.conopseum 24	150	129	128	101	109	115	104	92	102	111	108	115	110	110
7	Nidema.boothii 1	122	101	100	73	81	87	44	32	74	83	80	87	82	82
8	S. pulchella W20	106	85	84	103	111	117	114	102	86	95	92	99	94	94
9	H.imbricata 283	116	95	94	113	121	127	124	112	96	105	102	109	104	104
10	Reichenbachanthu	113	92	91	110	118	124	121	109	93	102	99	106	101	101
11	Hexadesmia K336	107	86	85	104	112	118	115	103	87	96	93	100	95	95
12	Acrorchis 399	111	90	89	108	116	122	119	107	91	100	97	104	99	99
13	Jacquiniella 313	115	94	93	112	120	126	123	111	95	104	101	108	103	103
14	Hagsatera 229	75	54	53	82	90	96	93	81	65	74	71	78	73	73
15	Homalopetalum 23	115	94	93	112	120	126	123	111	95	104	101	108	103	103
16	Meiracyllium tri	135	114	113	86	94	100	89	77	87	96	93	100	95	95
17	Psy.mcconnelliae	91	70	69	106	114	120	117	105	89	98	95	102	97	97
18	Psy.krugii 62	87	66	65	102	110	116	113	101	85	94	91	98	93	93
19	Brough.nigrilens	83	62	61	98	106	112	109	97	81	90	87	94	89	89
20	Tetramica.elegan	96	75	74	111	119	125	122	110	94	103	100	107	102	102
21	Domingoa 225	104	83	82	101	109	115	112	100	84	93	90	97	92	92
22	Cattleyopsis 251	85	64	63	100	108	114	111	99	83	92	89	96	91	91
23	Brassav.cucullat	79	58	65	114	122	128	125	113	97	106	103	110	105	105
24	L.rubescens w284	80	59	34	107	115	121	118	106	90	99	96	103	98	98
25	Myrmecophila 281	80	59	48	107	115	121	118	106	90	99	96	103	98	98
26	C.dowiana 282	55	34	51	100	108	114	111	99	83	92	89	96	91	91
27	Rhy.glauca N134	61	40	47	96	104	110	107	95	79	88	85	92	87	87
28	C.forbesii 59	62	41	58	107	115	121	118	106	90	99	96	103	98	98
29	Soph.cernua 145	-	49	72	121	129	135	132	120	104	113	110	117	112	112
30	L.purpurata 84	49	-	51	100	108	114	111	99	83	92	89	96	91	91
31	Schm.splendida 2	64	49	-	99	107	113	110	98	82	91	88	95	90	90
32	E.citrina 54	85	76	75	-	26	32	83	71	73	82	79	86	81	81
33	E.mariae 56	91	83	81	25	-	18	91	79	81	90	87	94	89	89
34	E.mariae 87	90	82	78	32	18	-	97	85	87	96	93	100	95	95
35	D.polybulbon 61	90	89	80	75	82	81	-	12	84	93	90	97	92	92
36	D.polybulbon 94	79	76	69	62	69	68	12	-	72	81	78	85	80	80
37	E.adenocaula 12	80	71	66	69	71	70	74	61	-	39	36	43	38	38
38	E.bractescens 21	91	77	73	71	80	79	75	63	39	-	43	50	45	45
39	E.aromatica 02	86	75	68	71	75	74	78	65	28	43	-	21	30	30
40	E.cordigera 24	87	72	69	72	76	75	79	68	33	50	21	-	37	37
41	E.tampensis 27	78	69	64	63	67	66	68	55	20	35	18	25	-	6
42	E.tampensis alba	78	69	66	65	69	68	70	57	24	37	24	29	6	-
43	E.dichroma 74	101	88	75	84	88	83	89	76	46	54	42	51	36	39
44	E.diurna 09	86	71	70	73	77	76	78	65	24	41	26	33	14	14
45	E.asperula 65	82	74	70	70	75	74	71	58	26	41	26	29	14	18
46	E.candollei 29	110	99	88	91	95	90	100	87	62	65	52	61	46	48
47	E.randii 50	82	73	50	69	73	70	68	57	29	37	27	36	23	26
48	E.kienastii 235	82	73	60	67	73	72	78	65	58	67	62	63	56	58
49	P.chimborazoensi	85	82	75	58	64	61	81	70	69	78	75	72	67	69
50	P.fragrans 172	83	82	75	56	62	59	79	66	71	78	75	74	65	67
51	P.aemula 17	85	86	81	58	64	61	83	70	71	78	77	78	67	69
52	P.cochleata 31	93	86	77	62	68	65	83	70	71	78	75	76	69	71
53	P.pygmaea 81	89	92	87	58	65	62	87	74	71	79	77	80	67	67
54	P.pseudopygmaea	86	87	82	57	64	61	82	69	66	74	72	75	62	62
55	P.vitellina 57	85	86	83	56	60	57	81	68	73	82	79	80	69	69
56	P.glauca 176	84	87	82	57	61	60	82	69	74	79	74	77	68	68
57	P.ionocentra 46	83	78	71	50	56	55	79	66	65	72	67	66	63	63
58	P.prismatocarpa	85	80	73	52	58	57	81	68	67	74	69	68	65	65
59	P.ochracea 95	87	88	79	50	54	53	77	64	67	74	73	74	63	63
60	P.cretacea 230	76	73	68	45	51	50	70	57	60	67	62	63	56	56
61	E.luteorosea 178	95	82	83	68	76	75	83	70	75	80	79	78	69	71
62	E.luteorosea 173	96	83	84	69	77	76	84	71	76	81	80	79	70	72
63	E.subulatifolia	101	96	89	88	93	88	87	74	85	89	93	94	81	83
64	E.subulatifolia	125	122	115	114	115	108	113	100	109	116	117	118	105	107
65	E.cyanocolumna 1	83	78	81	68	72	71	77	64	63	72	71	70	61	61
66	E.tenuissima 143	91	85	85	73	74	73	82	71	73	82	79	78	69	69

Appendix I—continued.

		43	44	45	46	47	48	49	50	51	52	53	54	55	56
1	Restrepiella 291	278	265	259	288	255	249	284	286	292	288	284	279	278	283
2	Pluer.racemiflor	287	274	268	297	264	258	293	295	301	297	293	288	287	292
3	Ponera.striata 1	199	186	180	209	176	170	205	207	213	209	205	200	199	204
4	Isochilis.major	191	178	172	201	168	162	197	199	205	201	197	192	191	196
5	Epi.ibaguense 60	148	135	129	158	125	129	136	138	144	140	136	131	130	135
6	Epi.conopseum 24	125	112	106	135	102	106	113	115	121	117	113	108	107	112
7	Nidema.boothii 1	97	84	78	107	74	78	85	87	93	89	85	80	79	84
8	S. pulchella W20	109	96	90	119	86	80	115	117	123	119	115	110	109	114
9	H.imbricata 283	119	106	100	129	96	90	125	127	133	129	125	120	119	124
10	Reichenbachanthu	116	103	97	126	93	87	122	124	130	126	122	117	116	121
11	Hexadesmia K336	110	97	91	120	87	81	116	118	124	120	116	111	110	115
12	Acrorchis 399	114	101	95	124	91	85	120	122	128	124	120	115	114	119
13	Jacquiniella 313	118	105	99	128	95	89	124	126	132	128	124	119	118	123
14	Hagsatera 229	88	75	69	98	65	59	94	96	102	98	94	89	88	93
15	Homalopetalum 23	118	105	99	128	95	89	124	126	132	128	124	119	118	123
16	Meiracyllium tri	110	97	91	120	87	91	98	100	106	102	98	93	92	97
17	Psy.mcconnelliae	112	99	93	122	89	83	118	120	126	122	118	113	112	117
18	Psy.krugii 62	108	95	89	118	85	79	114	116	122	118	114	109	108	113
19	Brough.nigrilens	104	91	85	114	81	75	110	112	118	114	110	105	104	109
20	Tetramica.elegan	117	104	98	127	94	88	123	125	131	127	123	118	117	122
21	Domingoa 225	107	94	88	117	84	78	113	115	121	117	113	108	107	112
22	Cattleyopsis 251	106	93	87	116	83	77	112	114	120	116	112	107	106	111
23	Brassav.cucullat	120	107	101	130	97	91	126	128	134	130	126	121	120	125
24	L.rubescens w284	113	100	94	123	90	84	119	121	127	123	119	114	113	118
25	Myrmecophila 281	113	100	94	123	90	84	119	121	127	123	119	114	113	118
26	C.dowiana 282	106	93	87	116	83	77	112	114	120	116	112	107	106	111
27	Rhy.glauca N134	102	89	83	112	79	73	108	110	116	112	108	103	102	107
28	C.forbesii 59	113	100	94	123	90	84	119	121	127	123	119	114	113	118
29	Soph.cernua 145	127	114	108	137	104	98	133	135	141	137	133	128	127	132
30	L.purpurata 84	106	93	87	116	83	77	112	114	120	116	112	107	106	111
31	Schm.splendida 2	105	92	86	115	82	76	111	113	119	115	111	106	105	110
32	E.citrina 54	96	83	77	106	73	77	64	66	72	68	64	59	58	63
33	E.mariae 56	104	91	85	114	81	85	72	74	80	76	72	67	66	71
34	E.mariae 87	110	97	91	120	87	91	78	80	86	82	78	73	72	77
35	D.polybulbon 61	107	94	88	117	84	88	95	97	103	99	95	90	89	94
36	D.polybulbon 94	95	82	76	105	72	76	83	85	91	87	83	78	77	82
37	E.adenocaula 12	53	40	34	63	30	60	85	87	93	89	85	80	79	84
38	E.bractescens 21	60	47	41	70	37	69	94	96	102	98	94	89	88	93
39	E.aromatica 02	53	32	26	63	30	66	91	93	99	95	91	86	85	90
40	E.cordigera 24	60	39	33	70	37	73	98	100	106	102	98	93	92	97
41	E.tampensis 27	55	14	20	65	32	68	93	95	101	97	93	88	87	92
42	E.tampensis alba	55	14	20	65	32	68	93	95	101	97	93	88	87	92
43	E.dichroma 74	-	57	51	28	41	83	108	110	116	112	108	103	102	107
44	E.diurna 09	41	-	22	67	34	70	95	97	103	99	95	90	89	94
45	E.asperula 65	42	22	-	61	28	64	89	91	97	93	89	84	83	88
46	E.candollei 29	28	56	54	-	51	93	118	120	126	122	118	113	112	117
47	E.randii 50	35	28	27	50	-	60	85	87	93	89	85	80	79	84
48	E.kienastii 235	73	64	62	86	56	-	89	91	97	93	89	84	83	88
49	P.chimborazoensi	84	73	71	99	71	71	-	14	20	30	52	47	48	53
50	P.fragrans 172	86	75	69	97	71	69	14	-	20	32	54	49	50	55
51	P.aemula 17	88	75	71	99	73	77	20	20	-	38	60	55	56	61
52	P.cochleata 31	86	75	75	101	71	71	30	30	36	-	56	51	52	57
53	P.pygmaea 81	92	77	70	99	75	77	48	44	48	48	-	11	48	53
54	P.pseudopygmaea	87	72	65	94	70	72	45	41	45	45	11	-	43	48
55	P.vitellina 57	92	77	73	101	75	75	42	38	42	44	44	41	-	35
56	P.glauca 176	87	78	74	98	72	74	43	39	43	47	51	48	35	-
57	P.ionocentra 46	80	69	69	95	65	67	34	32	38	38	46	41	36	35
58	P.prismatocarpa	80	71	71	97	67	69	32	32	36	36	46	41	38	35
59	P.ochracea 95	86	73	69	95	69	71	36	32	36	40	42	37	36	39
60	P.cretacea 230	77	64	60	88	60	60	31	29	33	37	33	30	25	30
61	E.luteorosea 178	90	79	73	97	73	75	80	76	80	84	82	79	78	77
62	E.luteorosea 173	91	80	74	98	74	76	81	77	81	85	83	80	79	78
63	E.subulatifolia	96	91	86	109	83	89	92	88	92	94	92	89	90	91
64	E.subulatifolia	117	115	110	129	107	115	118	114	118	120	116	113	116	115
65	E.cyanocolumna 1	84	71	65	95	69	71	78	72	78	80	76	69	70	73
66	E.tenuissima 143	92	79	73	101	73	73	84	78	84	86	81	74	78	81

Appendix I—continued.

		57	58	59	60	61	62	63	64	65	66
1	Restrepiella 291	282	280	274	267	282	283	298	326	276	288
2	Pluer.racemiflor	291	289	283	276	291	292	307	335	285	297
3	Ponera.striata 1	203	201	195	188	203	204	219	247	197	209
4	Isochilis.major	195	193	187	180	195	196	211	239	189	201
5	Epi.ibaguense 60	134	132	126	119	118	119	94	122	112	124
6	Epi.conopseum 24	111	109	103	96	95	96	71	99	89	101
7	Nidema.boothii 1	83	81	75	68	75	76	91	119	69	81
8	S. pulchella W20	113	111	105	98	113	114	129	157	107	119
9	H.imbricata 283	123	121	115	108	123	124	139	167	117	129
10	Reichenbachanthu	120	118	112	105	120	121	136	164	114	126
11	Hexadesmia K336	114	112	106	99	114	115	130	158	108	120
12	Acrorchis 399	118	116	110	103	118	119	134	162	112	124
13	Jacquiniella 313	122	120	114	107	122	123	138	166	116	128
14	Hagsatera 229	92	90	84	77	92	93	108	136	86	98
15	Homalopetalum 23	122	120	114	107	122	123	138	166	116	128
16	Meiracyllium tri	96	94	88	81	80	81	76	104	74	86
17	Psy.mcconnelliae	116	114	108	101	116	117	132	160	110	122
18	Psy.krugii 62	112	110	104	97	112	113	128	156	106	118
19	Brough.nigrilens	108	106	100	93	108	109	124	152	102	114
20	Tetramica.elegan	121	119	113	106	121	122	137	165	115	127
21	Domingoa 225	111	109	103	96	111	112	127	155	105	117
22	Cattleyopsis 251	110	108	102	95	110	111	126	154	104	116
23	Brassav.cucullat	124	122	116	109	124	125	140	168	118	130
24	L.rubescens w284	117	115	109	102	117	118	133	161	111	123
25	Myrmecophila 281	117	115	109	102	117	118	133	161	111	123
26	C.dowiana 282	110	108	102	95	110	111	126	154	104	116
27	Rhy.glauca N134	106	104	98	91	106	107	122	150	100	112
28	C.forbesii 59	117	115	109	102	117	118	133	161	111	123
29	Soph.cernua 145	131	129	123	116	131	132	147	175	125	137
30	L.purpurata 84	110	108	102	95	110	111	126	154	104	116
31	Schm.splendida 2	109	107	101	94	109	110	125	153	103	115
32	E.citrina 54	62	60	54	47	82	83	98	126	76	88
33	E.mariae 56	70	68	62	55	90	91	106	134	84	96
34	E.mariae 87	76	74	68	61	96	97	112	140	90	102
35	D.polybulbon 61	93	91	85	78	85	86	101	129	79	91
36	D.polybulbon 94	81	79	73	66	73	74	89	117	67	79
37	E.adenocaula 12	83	81	75	68	83	84	99	127	77	89
38	E.bractescens 21	92	90	84	77	92	93	108	136	86	98
39	E.aromatica 02	89	87	81	74	89	90	105	133	83	95
40	E.cordigera 24	96	94	88	81	96	97	112	140	90	102
41	E.tampensis 27	91	89	83	76	91	92	107	135	85	97
42	E.tampensis alba	91	89	83	76	91	92	107	135	85	97
43	E.dichroma 74	106	104	98	91	106	107	122	150	100	112
44	E.diurna 09	93	91	85	78	93	94	109	137	87	99
45	E.asperula 65	87	85	79	72	87	88	103	131	81	93
46	E.candollei 29	116	114	108	101	116	117	132	160	110	122
47	E.randii 50	83	81	75	68	83	84	99	127	77	89
48	E.kienastii 235	87	85	79	72	87	88	103	131	81	93
49	P.chimborazoensi	34	32	36	37	94	95	110	138	88	100
50	P.fragrans 172	36	34	38	39	96	97	112	140	90	102
51	P.aemula 17	42	40	44	45	102	103	118	146	96	108
52	P.cochleata 31	38	36	40	41	98	99	114	142	92	104
53	P.pygmaea 81	50	48	42	37	94	95	110	138	88	100
54	P.pseudopygmaea	45	43	37	32	89	90	105	133	83	95
55	P.vitellina 57	46	44	38	25	88	89	104	132	82	94
56	P.glauca 176	51	49	43	30	93	94	109	137	87	99
57	P.ionocentra 46	-	14	34	35	92	93	108	136	86	98
58	P.prismatocarpa	14	-	32	33	90	91	106	134	84	96
59	P.ochracea 95	32	32	-	27	84	85	100	128	78	90
60	P.cretacea 230	25	25	25	-	77	78	93	121	71	83
61	E.luteorosea 178	76	76	74	67	-	1	92	120	58	70
62	E.luteorosea 173	77	77	75	68	1	-	93	121	59	71
63	E.subulatifolia	90	92	80	79	86	87	-	34	86	98
64	E.subulatifolia	116	118	108	105	111	112	34	-	114	126
65	E.cyanocolumna 1	68	68	66	61	58	59	80	105	-	34
66	E.tenuissima 143	76	76	68	67	70	71	83	109	34	-

Note: Multistate unordered characters are excluded from patristic distance calculations.

APPENDIX J
PAIRWISE HOMOPLASY MATRIX.

Appendix J—continued.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Restrepiella 291	-																
2	Pluer.racemiflor	0	-															
3	Ponera.striata 1	10	18	-														
4	Isochilis.major	14	12	0	-													
5	Epi.ibaguense 60	62	70	52	56	-												
6	Epi.conopseum 24	62	66	58	64	0	-											
7	Nidema.boothii 1	30	39	32	25	13	19	-										
8	S. pulchella W20	12	14	11	8	44	52	30	-									
9	H.imbricata 283	18	18	8	8	48	50	35	0	-								
10	Reichenbachanthu	18	20	9	6	48	50	30	4	0	-							
11	Hexadesmia K336	12	12	6	8	52	60	35	0	2	0	-						
12	Acrorchis 399	16	22	10	10	52	56	32	0	8	4	0	-					
13	Jacquiniella 313	22	22	12	14	52	54	32	0	4	2	2	0	-				
14	Hagsatera 229	14	16	12	12	24	32	15	10	14	12	14	10	12	-			
15	Homalopetalum 23	26	28	12	10	42	44	27	12	12	13	14	10	12	3	-		
16	Meiracyllium tri	56	56	42	42	10	6	8	30	34	34	34	38	38	18	31	-	
17	Psy.mcconnelliae	20	30	18	18	36	40	23	14	16	14	20	14	14	6	9	24	-
18	Psy.krugii 62	20	30	18	18	36	40	23	14	16	14	20	14	14	6	9	24	0
19	Brough.nigrilens	24	30	16	14	36	38	23	10	14	14	18	10	12	4	11	24	0
20	Tetramica.elegan	26	34	28	26	48	52	31	18	18	20	24	24	22	6	17	36	0
21	Domingoa 225	16	30	10	8	40	44	22	6	0	2	10	4	4	2	0	28	16
22	Cattleyopsis 251	20	28	18	16	36	44	29	14	18	14	24	16	14	2	15	28	0
23	Brassav.cucullat	36	40	32	32	58	56	34	26	28	28	28	30	36	12	25	44	16
24	L.rubescens w284	26	32	22	26	52	58	35	22	24	22	30	24	22	16	25	42	16
25	Myrmecophila 281	18	30	20	20	44	46	19	14	16	12	16	16	12	0	6	28	10
26	C.dowiana 282	22	26	14	14	36	40	18	14	14	14	16	16	16	2	13	28	4
27	Rhy.glauca N134	28	30	16	16	48	48	28	20	22	22	22	22	24	10	23	40	10
28	C.forbesii 59	30	39	18	23	39	43	18	16	17	14	23	18	18	7	12	28	11
29	Soph.cernua 145	32	46	30	32	58	64	39	26	30	22	34	26	28	12	29	46	12
30	L.purpurata 84	30	36	24	24	34	40	20	14	14	14	16	16	18	2	13	30	8
31	Schm.splendida 2	24	30	22	24	44	52	25	18	20	16	22	20	18	10	12	32	12
32	E.citrina 54	34	38	26	24	16	22	2	22	20	20	26	26	24	18	29	10	22
33	E.mariae 56	39	42	29	28	18	24	3	25	28	25	28	31	27	20	32	13	24
34	E.mariae 87	54	53	42	41	25	29	10	32	35	32	35	38	38	27	41	22	31
35	D.polybulbon 61	32	40	28	24	22	22	0	30	28	30	36	30	30	16	33	8	30
36	D.polybulbon 94	33	41	29	25	23	23	1	31	29	31	35	31	31	17	34	9	31
37	E.adenocaula 12	14	16	12	14	18	22	5	8	8	8	16	10	8	4	11	8	12
38	E.bractescens 21	17	18	13	20	22	28	7	11	10	9	18	11	9	4	12	11	18
39	E.aromatica 02	14	22	18	20	22	28	9	10	10	10	16	12	10	6	11	12	16
40	E.cordigera 24	22	28	22	26	26	32	11	18	18	18	24	20	18	14	17	18	22
41	E.tampensis 27	24	30	26	28	30	36	17	20	20	20	28	26	20	14	25	24	22
42	E.tampensis alba	24	28	22	26	30	36	17	18	20	16	28	26	20	14	23	24	20
43	E.dichroma 74	35	43	37	33	28	32	13	18	18	17	24	20	16	14	21	22	23
44	E.diurna 09	18	22	20	22	24	28	9	14	14	12	22	18	16	12	17	16	18
45	E.asperula 65	17	20	17	16	20	26	9	13	12	13	20	17	15	8	18	19	12
46	E.candollei 29	32	42	34	32	29	33	14	15	17	13	21	19	13	7	18	25	21
47	E.randii 50	14	22	16	16	22	28	7	10	10	9	18	10	8	4	11	14	14
48	E.kienastii 235	14	18	8	12	22	32	9	8	8	8	14	6	8	4	1	12	10
49	P.chimborazoensi	46	48	34	32	34	26	11	34	34	32	36	32	32	32	31	16	32
50	P.fragrans 172	50	54	40	38	36	34	17	40	38	36	40	36	36	36	37	22	34
51	P.aemula 17	48	54	38	36	38	34	19	38	38	34	38	36	34	34	39	24	36
52	P.cochleata 31	44	48	34	32	34	30	13	32	34	32	36	34	36	30	31	14	34
53	P.pygmaea 81	40	34	30	28	22	28	8	26	26	24	30	28	30	22	31	18	20
54	P.pseudopygmaea	38	32	32	28	20	28	6	26	24	22	30	26	28	20	31	14	20
55	P.vitellina 57	40	36	26	26	20	24	9	26	30	26	32	28	28	24	29	12	20
56	P.glauca 176	40	52	32	32	28	34	13	26	32	28	32	32	30	22	31	12	26
57	P.ionocentra 46	44	48	34	38	32	34	11	32	34	30	36	34	34	32	29	20	34
58	P.prismatocarpa	42	46	30	34	28	30	7	28	30	26	32	30	30	28	27	16	30
59	P.ochracea 95	36	36	24	26	26	26	3	22	24	20	28	24	22	18	25	10	20
60	P.cretacea 230	40	38	28	30	24	30	7	26	30	26	32	26	30	26	27	12	24
61	E.luteorosea 178	42	50	38	36	8	16	5	28	32	30	36	32	28	20	27	2	30
62	E.luteorosea 173	42	50	38	36	8	16	5	28	32	30	36	32	28	20	27	2	30
63	E.subulatifolia	60	64	56	52	2	0	8	42	44	42	48	48	50	20	44	0	28
64	E.subulatifolia	68	74	68	63	0	0	14	44	46	44	50	50	54	23	48	0	29
65	E.cyanocolumna 1	40	46	40	42	12	18	3	28	31	25	34	30	28	22	23	2	22
66	E.tenuissima 143	51	54	49	52	18	26	5	33	36	31	40	37	33	28	30	7	22

Appendix J—continued.

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
18 Psy.krugii 62	-																
19 Brough.nigrilens	0	-															
20 Tetramica.elegan	0	0	-														
21 Domingoa 225	16	14	20	-													
22 Cattleyopsis 251	0	0	4	16	-												
23 Brassav.cucullat	16	12	16	24	12	-											
24 L.rubescens w284	16	16	20	28	20	18	-										
25 Myrmecophila 281	10	6	10	10	8	4	0	-									
26 C.dowiana 282	4	4	2	6	6	0	6	2	-								
27 Rhy.glauca N134	10	12	10	18	8	0	16	4	0	-							
28 C.forbesii 59	11	7	5	14	9	6	7	9	0	0	-						
29 Soph.cernua 145	12	14	16	24	18	18	24	10	0	12	1	-					
30 L.purpurata 84	8	8	6	10	10	10	6	6	0	0	6	0	-				
31 Schm.splendida 2	12	6	12	18	6	10	0	0	2	8	7	8	2	-			
32 E.citrina 54	22	26	24	26	22	34	38	16	22	30	22	36	24	24	-		
33 E.mariae 56	24	32	26	31	26	35	42	22	23	31	23	38	25	26	1	-	
34 E.mariae 87	31	39	33	40	33	42	49	29	30	40	30	45	32	35	0	0	-
35 D.polybulbon 61	30	26	36	30	28	36	36	22	20	30	20	42	22	30	8	9	16
36 D.polybulbon 94	31	27	37	31	29	37	37	23	21	31	21	41	23	29	9	10	17
37 E.adenocaula 12	12	8	16	14	12	18	22	12	8	14	11	24	12	16	4	10	17
38 E.bractescens 21	16	12	18	15	16	19	24	14	11	15	15	22	15	18	11	10	17
39 E.aromatica 02	16	10	18	16	14	16	24	14	12	14	13	24	14	20	8	12	19
40 E.cordigera 24	22	14	24	20	18	24	30	20	20	22	21	30	24	26	14	18	25
41 E.tampensis 27	22	18	32	26	24	24	34	20	16	22	19	34	22	26	18	22	29
42 E.tampensis alba	20	16	30	24	22	24	34	18	14	22	17	34	22	24	16	20	27
43 E.dichroma 74	23	16	28	26	20	22	30	20	14	20	17	26	18	30	12	16	27
44 E.diurna 09	18	14	24	20	18	22	28	18	14	20	17	28	22	22	10	14	21
45 E.asperula 65	12	8	22	17	14	17	24	10	9	15	11	26	13	16	7	10	17
46 E.candollei 29	21	13	25	21	19	19	31	19	13	17	20	27	17	27	15	19	30
47 E.randii 50	14	10	18	18	14	16	30	14	8	14	11	22	10	32	4	8	17
48 E.kienastii 235	10	4	16	8	6	12	18	4	4	10	7	16	4	16	10	12	19
49 P.chimborazoensi	32	28	34	30	26	46	42	28	28	42	35	48	30	36	6	8	17
50 P.fragrans 172	34	30	38	34	30	46	46	30	30	44	37	52	32	38	10	12	21
51 P.aemula 17	36	34	40	38	34	46	50	32	34	44	39	56	34	38	14	16	25
52 P.cochleata 31	34	32	34	28	30	40	42	32	28	40	33	44	30	38	6	8	17
53 P.pygmaea 81	20	20	28	24	20	34	38	18	18	30	22	44	20	24	6	7	16
54 P.pseudopygmaea	20	16	26	24	18	34	36	18	18	30	22	42	20	24	2	3	12
55 P.vitellina 57	20	22	24	24	20	36	40	18	20	32	23	42	20	22	2	6	15
56 P.glauca 176	26	26	30	30	26	36	42	20	22	34	25	48	24	28	6	10	17
57 P.ionocentra 46	34	30	34	30	26	44	46	30	32	42	35	48	32	38	12	14	21
58 P.prismatocarpa	30	26	30	26	22	40	42	28	28	38	33	44	28	34	8	10	17
59 P.ochracea 95	20	16	24	24	16	32	36	14	14	28	17	36	14	22	4	8	15
60 P.cretacea 230	24	22	26	24	20	32	36	18	22	30	25	40	22	26	2	4	11
61 E.luteorosea 178	30	26	34	26	32	30	36	22	24	24	29	36	28	26	14	14	21
62 E.luteorosea 173	30	26	34	26	32	30	36	22	24	24	29	36	28	26	14	14	21
63 E.subulatifolia	28	30	44	42	40	48	44	30	32	36	36	46	30	36	10	13	24
64 E.subulatifolia	29	30	44	44	40	48	44	30	34	36	36	50	32	38	12	19	32
65 E.cyanocolumna 1	22	20	26	20	26	32	34	24	22	22	27	42	26	22	8	12	19
66 E.tenuissima 143	22	22	28	29	30	37	38	26	27	27	33	46	31	30	15	22	29

Appendix J—continued.

	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
35 D.polybulbon 61	-																
36 D.polybulbon 94	0	-															
37 E.adenocaula 12	10	11	-														
38 E.bractescens 21	18	18	0	-													
39 E.aromatica 02	12	13	8	0	-												
40 E.cordigera 24	18	17	10	0	0	-											
41 E.tampensis 27	24	25	18	10	12	12	-										
42 E.tampensis alba	22	23	14	8	6	8	0	-									
43 E.dichroma 74	18	19	7	6	11	9	19	16	-								
44 E.diurna 09	16	17	16	6	6	6	0	0	16	-							
45 E.asperula 65	17	18	8	0	0	4	6	2	9	0	-						
46 E.candollei 29	17	18	1	5	11	9	19	17	0	11	7	-					
47 E.randii 50	16	15	1	0	3	1	9	6	6	6	1	1	-				
48 E.kienastii 235	10	11	2	2	4	10	12	10	10	6	2	7	4	-			
49 P.chimborazoensi	14	13	16	16	16	26	26	24	24	22	18	19	14	18	-		
50 P.fragrans 172	18	19	16	18	18	26	30	28	24	22	22	23	16	22	0	-	
51 P.aemula 17	20	21	22	24	22	28	34	32	28	28	26	27	20	20	0	0	-
52 P.cochleata 31	16	17	18	20	20	26	28	26	26	24	18	21	18	22	0	2	2
53 P.pygmaea 81	8	9	14	15	14	18	26	26	16	18	19	19	10	12	4	10	12
54 P.pseudopygmaea	8	9	14	15	14	18	26	26	16	18	19	19	10	12	2	8	10
55 P.vitellina 57	8	9	6	6	6	12	18	18	10	12	10	11	4	8	6	12	14
56 P.glauca 176	12	13	10	14	16	20	24	24	20	16	14	19	12	14	10	16	18
57 P.ionocentra 46	14	15	18	20	22	30	28	28	26	24	18	21	16	20	0	4	4
58 P.prismatocarpa	10	11	14	16	18	26	24	24	24	20	14	17	14	16	0	2	4
59 P.ochracea 95	8	9	8	10	8	14	20	20	12	12	10	13	6	8	0	6	8
60 P.cretacea 230	8	9	8	10	12	18	20	20	14	14	12	13	8	12	6	10	12
61 E.luteorosea 178	2	3	8	12	10	18	22	20	16	14	14	19	10	12	14	20	22
62 E.luteorosea 173	2	3	8	12	10	18	22	20	16	14	14	19	10	12	14	20	22
63 E.subulatifolia	14	15	14	19	12	18	26	24	26	18	17	23	16	14	18	24	26
64 E.subulatifolia	16	17	18	20	16	22	30	28	33	22	21	31	20	16	20	26	28
65 E.cyanocolumna 1	2	3	14	14	12	20	24	24	16	16	16	15	8	10	10	18	18
66 E.tenuissima 143	9	8	16	16	16	24	28	28	20	20	20	21	16	20	16	24	24

Appendix J—continued.

	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
52 P.cochleata 31	-														
53 P.pygmaea 81	8	-													
54 P.pseudopygmaea	6	0	-												
55 P.vitellina 57	8	4	2	-											
56 P.glauca 176	10	2	0	0	-										
57 P.ionocentra 46	0	4	4	10	16	-									
58 P.prismatocarpa	0	2	2	6	14	0	-								
59 P.ochracea 95	0	0	0	2	4	2	0	-							
60 P.cretacea 230	4	4	2	0	0	10	8	2	-						
61 E.luteorosea 178	14	12	10	10	16	16	14	10	10	-					
62 E.luteorosea 173	14	12	10	10	16	16	14	10	10	0	-				
63 E.subulatifolia	20	18	16	14	18	18	14	20	14	6	6	-			
64 E.subulatifolia	22	22	20	16	22	20	16	20	16	9	9	0	-		
65 E.cyanocolumna 1	12	12	14	12	14	18	16	12	10	0	0	6	9	-	
66 E.tenuissima 143	18	19	21	16	18	22	20	22	16	0	0	15	17	0	-

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BIOGRAPHICAL SKETCH

Wesley Ervin Higgins, the son of a carpenter and a chemist, was born in Richmond, Virginia. His primary and secondary education was the product of the Lee County school system, Fort Myers, Florida. Based on the Florida Senior Placement Test, Wesley ranked in the top 10 percent of his High School class. Following graduation, Wesley enlisted in the United States Coast Guard where he received training in basic electronics, radio code, and avionics. His first Associate of Science degree was earned through the external degree program of the University of the State of New York (Regents College). Wesley received advanced training in avionics at the Naval Aviation Technical Training Center, Memphis, Tennessee. Subsequently, Wesley attended DeVry Institute of Technology in Atlanta, Georgia, where here earned an Associate of Science in Electronics Engineering Technology. Wesley was selected IEEE Student of the Year while at DeVry. While stationed at the U. S. Coast Guard Institute in Oklahoma City, he worked as a technical writer preparing correspondence course material and standardized promotion exams. Wesley's course material received an Award of Excellence from the Society for Technical Communications. During this period, he received a Bachelor of Science degree in Applied Technology through the Competency Based Degree Program of Oklahoma City University. Wesley sharpened his organization skills as the Aviation Training Quota Manager at the USCG Aviation Technical Training Center, Elizabeth City, North Carolina, where he managed the annual budget ($5,000,000) for training pilots and aircrewmen.

Wesley has completed a six-year program of study to become an accredited American Orchid Society (AOS) judge. He has published articles in the *AOS Bulletin* AKA *Orchids* and his photography has been awarded at a World Orchid Conference and appeared on the cover of the *AOS Bulletin.* Following retirement from the USCG as a Master Chief Petty Officer (ATCM), Wesley earned a Bachelor of Science in Environmental Horticulture at the University of Florida graduating with Highest Honors. He continued his education at the University of Florida earning a Ph.D. with a Horticultural Science major and Botany minor. Wesley received practical training at Marie Selby Botanical Gardens, Missouri Botanical Garden, and the Jodrell Laboratory of Royal Botanical Gardens, Kew. Following graduation, Wesley plans to seek employment as a plant taxonomist.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Bijan Dehgan, Chairman
Professor of Horticultural Science

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Thomas J. Sheehan, Cochairman
Professor Emeritus of Horticultural Science

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Walter Judd
Professor of Botany

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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May 2000

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